

PERIODICAL ROOMS
GENERAL LIBRARY
UNIV. OF MICHIGAN

AUG 4 1933

THE
QUARTERLY JOURNAL
OF
ECONOMICS

VOL. XLVII

AUGUST, 1933

No. 4

CONTENTS

I. THE ECONOMIC EFFECTS OF THE GOLD DISCOVERIES UPON SOUTH AFRICA: 1886-1910	<i>Donald Wood Gilbert</i>	553
II. THE UNITY OF VEBLEN'S THEORETICAL SYSTEM	<i>Karl L. Anderson</i>	598
III. THE DEMAND FOR LABOR.....	<i>A. E. Monroe</i>	627
IV. GOLD PRODUCTION AND THE PRICE LEVEL: THE CASSEL THREE PER CENT ESTIMATE	<i>J. T. Phinney</i>	647
V. TAX SHIFTING AND THE LAWS OF COST. <i>Elmer D. Fagan</i>		680
Books Received.....		711

CAMBRIDGE, MASS., U.S.A.
HARVARD UNIVERSITY PRESS

LONDON: HUMPHREY MILFORD
OXFORD UNIVERSITY PRESS

1933

The Quarterly Journal of Economics

Published by Harvard University

Books, periodicals, and manuscript to be addressed, EDITORS of QUARTERLY JOURNAL OF ECONOMICS, Cambridge, Mass.

Business letters to be addressed, HARVARD UNIVERSITY PRESS, Randall Hall, Cambridge, Mass. Subscription, \$5.00 a year.

Editor

F. W. TAUSSIG

Assistant Editor

A. E. MONROE

Associate Editors

C. J. BULLOCK

H. H. BURBANK

E. F. GAY

JOHN D. BLACK

J. A. SCHUMPETER

W. L. CRUM

W. Z. RIPLEY

J. H. WILLIAMS

CONTENTS FOR FEBRUARY, 1933

I. THE LITERATURE ON RAILWAY RATE THEORY	D. Philip Locklin.
II. THEORETICAL REMARKS ON PRICE POLICY. HOTELLING'S CASE WITH VARIATIONS	F. Zeuthen
III. THE LOCATION OF THE SHOE INDUSTRY IN THE UNITED STATES	E. M. Hoover, Jr.
IV. THE PROCESS OF INDUSTRIAL CONCENTRATION	Arthur Robert Burns
V. UNEMPLOYMENT RESERVES: SOME QUESTIONS OF PRINCIPLE	R. S. Meriam
LITERATURE, NOTES AND DISCUSSIONS:	
The Theory of Railway Rates Once More	F. W. Taussig
The Elasticity of Demand from Family Budgets	A. C. Pigou
The Wooden Money of Tenino	Howard H. Preston
Member Bank Reserves and Bank Debits	L. B. Currie
Speculation and the Stability of Stock Prices	M. J. Fields
Life Tables for Automobiles	George Gardner
Books Received	

CONTENTS FOR MAY, 1933

I. "THE NATURE AND SIGNIFICANCE OF ECONOMIC SCIENCE" IN RECENT DISCUSSION	R. W. Souter
II. LARGE-SCALE ENTERPRISE IN THE LIGHT OF INCOME TAX RETURNS	W. L. Crum
III. RELATION OF CALL MONEY RATES TO STOCK MARKET SPECULATION	W. J. Eiteman
IV. ONE YEAR OF THE RECONSTRUCTION FINANCE CORPORATION	J. Franklin Ebersole
V. THE USE OF INDIFFERENCE CURVES IN THE ANALYSIS OF FOREIGN TRADE	W. W. Leontief
LITERATURE, NOTES AND DISCUSSIONS:	
The Literature of the Crisis	M. W. Watkins
Harvest Labor in Western Canada: An Episode in Economic Planning	G. V. Haythorne
Velocity of Circulation of Goods	R. H. Lounsbury
Books Received	

COPYRIGHT, 1933, BY THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE

Entered as Second-class Mail Matter. Acceptance for mailing at special postage rate provided for by Section 1103, Act of October 3, 1917, authorized on July 31, 1918.]

S

LY

all

llr.

en

Jr.

ns

am

sig

ou

on

rie

ds

er

er

m

an

le

ef

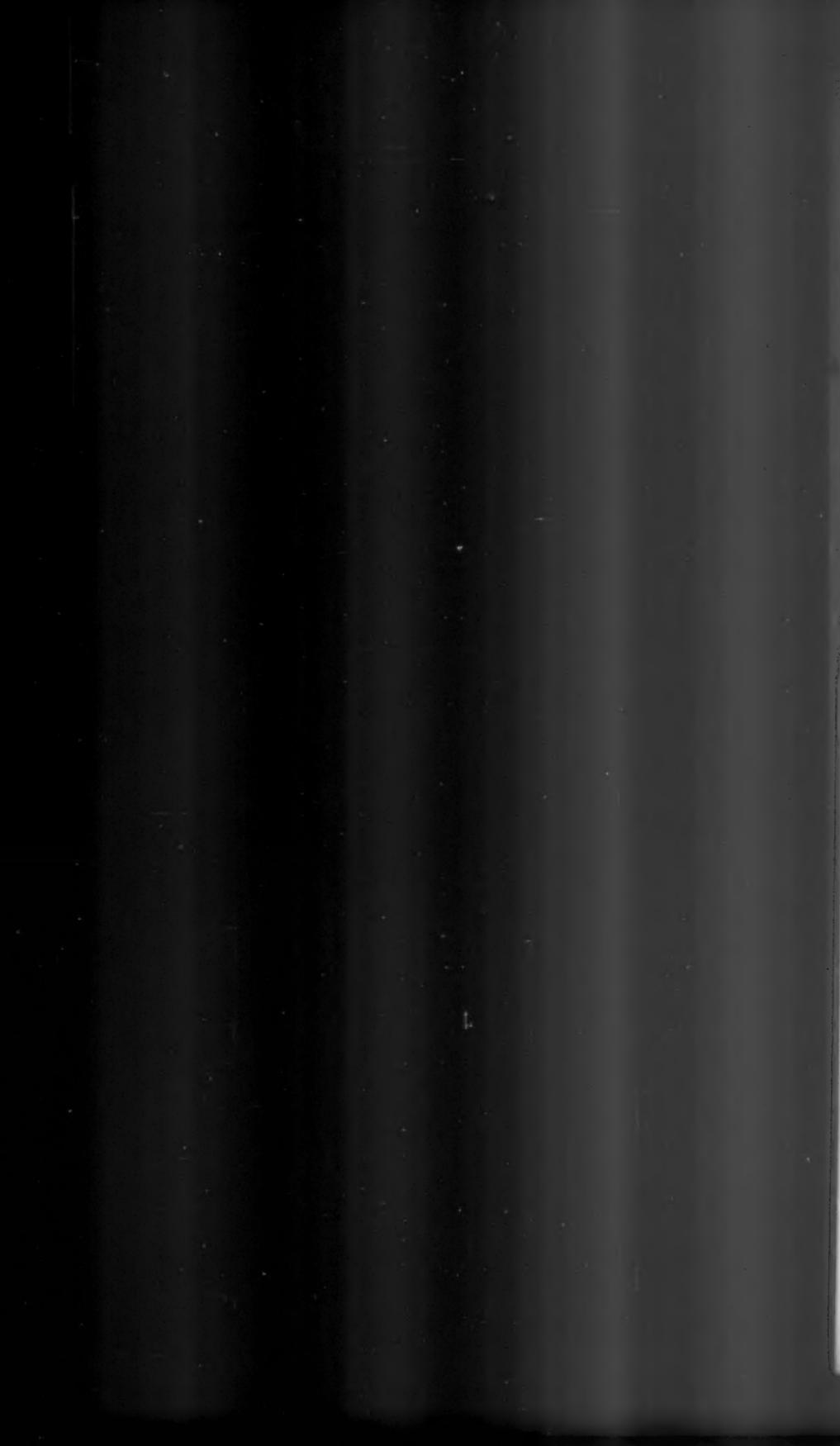
ns

ne

ry

-

on



THE
QUARTERLY JOURNAL
OF
ECONOMICS

AUGUST, 1933

THE ECONOMIC EFFECTS OF THE GOLD
DISCOVERIES UPON SOUTH AFRICA: 1886-1910

SUMMARY

Introductory survey, 553.—Development of the gold industry, 557.—Capital imports and their timing, 560.—The expansion of purchasing power, 567.—Price movements: foods, 570; house rents, 572; imports, 574; exports, 574; complications, 576.—Money incomes, 578.—Immigration, 582.—The balance of payments, 583.—Trade statistics, 585.—Other items in the balance, 587.—The terms of trade, 588.—Comparative advantages and disadvantages: exports, 590; imports, 592; production, 593.—Conclusion, 596.

Several successful attempts have been made in recent years to verify the principles of international trade as developed by modern economists. The studies of Professors Taussig, Viner and Williams, dealing with England, Canada, the United States and Argentina, are well known. In none of these investigations, which have dealt largely with capital movements or a depreciating currency, has the case been complicated by the discovery of gold on a large scale which was at once the occasion for the appearance of a striking comparative advantage and for a considerable movement of capital.

South Africa's gold discoveries present a peculiarly happy situation for a study of the changes accompanying these new conditions. The country was small, almost solely pastoral or agricultural, undeveloped and, neglecting the diamond discoveries, growing but slowly. Into this simple economy there suddenly burst a vast predominant force, creating a new industry overnight whose product, gold, should exercise its powerful effects upon the whole world. In the larger world

sphere those effects are mixed with the tangled forces of a great dynamic machine civilization. In South Africa there was little to cloud the picture and, when great changes appear within that country, one cannot go far astray in linking them to gold. Thus, while the conditions are by no means those of a perfect vacuum or of the chemist's laboratory experiment, there is an approximation to *caeteris paribus* which the economist too seldom enjoys.

At first glance, it might be supposed that South Africa merely offers on a somewhat larger scale the conditions so ably discussed by Cairnes in his papers concerning the Australian discoveries. Such a judgment would be quite erroneous. Unlike Australia which was soon provided with a domestic refinery and mint, the product of the South African mines, raw bullion, went out of the country in the same manner as any other merchandise export, without reference to exchange rates or specie points. It was shipped directly to London agents (Messrs. Rothchild) by the producers or by the South African banks acting for them. Until 1921 South Africa had no refinery, and tho a mint was established in 1890 which operated until shortly after the Boer War, it was a factor of small importance, coining only £2,383,771 of gold during its life.¹ Against the shipments of uncoined gold, if later practice is any criterion, the banks made advances to the producers or purchased the latters' bills drawn against the shipments. The gold was not purchased by the banks outright but was merely handled by them as agents for the mines, advances being made up to a certain percentage of the value of each consignment.² In London, the shipments consigned to the agents were refined and then sold in the gold market or to the Bank of England at its minimum buying price of £3 17s. 9d. per standard ounce. Thereupon the mines or the South African banks were in possession of large London balances, part of which were used to pay dividends and purchase equipment abroad and a part used in South Africa for payment of wages,

1. Official Yearbook, Union of South Africa, vol. 7, p. 788.

2. Kemmerer Report on the Resumption of Gold Payments, Pretoria, 1925, pp. 133, 167.

purchase of local supplies and payment of taxes. A considerable part of the credits from these bullion exports might be brought directly to South Africa in the form of specie. There is no evidence that it was customary for the banks to allow large London balances to be built up and left abroad.³

It is, thus, the movement of coined gold and refined gold bars, not crude gold bullion, which must be watched as indicating shifts in South Africa's international trade position. The former flow will be seen later to have occurred in large amounts and, on balance, to have been toward the country—not away from it. This movement of course involved the specie point mechanism and resulted in the frequent appearance of a discount on London exchange at Cape Town. Its size, greater in proportion to the forces affecting South Africa than might have been expected, is accounted for (in greater detail later) by the peculiar circumstance that the Kaffir worker insisted upon receiving his wages in sovereigns rather than bank notes and carried the coins away with him to his native lands. There they were lost in large part to South African circulation. This persistent drain had to be met by constant importations of English sovereigns.

Australia's gold was discovered in alluvial deposits, workable with pick, shovel and pan and requiring merely the inducement of a high daily return to attract men from every path of life to the gold fields. The effects upon wages, prices and domestic industry were obvious, direct and almost immediate. South Africa, on the contrary, offered little to the individual. The gold, discovered in a distant and inaccessible region, existed in minute particles in a hard rock conglomerate. The gold reefs extended at a dip from the surface to a depth of many thousand feet covering several hundred square miles of territory and, even in the richest sections, averaged a low ore content. To merely extract the rock would require a vast

3. Bankers Magazine, London, vol. 1, 1895, p. 732. "Our coin always figures at a large sum and, in connection with the present balance of £674,000, I may state that the amount is mainly held in South Africa. Occasionally we have surplus balances in London which are invested in temporary loans. . . . The conditions of trade in the colonies are such that we have to keep a large cash balance there."

investment in shafts, machinery and development. The rock, blasted out with explosives, must then be crushed and treated chemically in a long and difficult process demanding a great additional investment before an ounce of gold would be forthcoming.

Here are the conditions for corporate organization, a world-wide participation in supplying funds and a large scale industry. In many respects still a gamble, the risks would be somewhat reduced by the predictable character of the reefs, by the relative evenness of the gold content and by the vast quantity of payable ore. The necessity for a complicated ore reduction process changed the venture from a purely mining industry to one primarily of manufacture and lent a greater degree of stability to the operations. The individual miner operating independently found no place in such a situation. The discoveries demanded big business, the captain of industry and a vast capitalistic organization.

In another respect the two cases differ. Australia's gold called for immigration on a vast scale to supply the necessary workers. South Africa found hers ready at hand. The rough heavy work could be performed by the blacks, at a fraction of the wages demanded by white workers. The latter were reserved for the positions requiring skill and judgment. Some consideration will be given later to the question of the real efficiency of the Kaffir worker or "boy" but it may be asserted here (the demonstration to follow) that the South African mining companies possessed the advantage of a low-lying, non-competing group far below the level of wages of similar groups in other countries, which provided an additional element of advantage to the South African industry.

Finally it must be noted that the Australian discoveries came at a time when the science of statistics was virtually unknown and when it was impossible to study in detail by quantitative measures the economic changes which followed. On the other hand, the South African colonies were a generation early in the collection of statistical information. True, the figures are undoubtedly subject to a large element of error and must be accepted with reservations. It is also true that

no satisfactory data can be obtained for the Transvaal itself. But the statisticians of the Cape of Good Hope have provided a wealth of material from which it has been possible to compute indexes which show roughly many of the important trends.

DEVELOPMENT OF THE GOLD INDUSTRY

The real development of South African gold mining came in the years after 1886. Scattered deposits both alluvial and quartz had been found during the preceding two decades but it was not until 1886 that the Witwatersrand main reef was discovered. By July of that year the news had reached Kimberley and Cecil J. Rhodes with other diamond industry capitalists hastened to the scene.⁴ By September the first large company had been formed which was quickly followed by many others. The investing public of Germany, France and England was electrified by the glowing prospects painted by the promoters and rushed to provide the necessary capital to exploit the new Eldorado. By 1888, there were 44 producing companies and output was increasing in a great surge.⁵ The following table, which gives the output in ounces and in value for the early years, shows the 4000 per cent increase in output from 1886 to 1889, the constant rise which culminated in the maximum prewar yield of 3,823,367 in 1898, the virtual cessation of activity during the Boer War and the persistent growth to the 7,527,108 ounces in 1910.

Speculation in South African shares soon drove their values to crazy figures in 1888. In December of that year a nominal share capital of £942,000 for twelve of the larger producers had been inflated to £9,041,000 on the market.⁶ Beneath the froth, however, was a steady inflow of capital equipment in the form of machinery, stamps, explosives and timber. By 1889, £6,800,000 had been invested, if we may use the nominal capital figure as an indication, and this investment was being valued at £13,255,000 on the bourses of Europe

4. Transvaal Handbook; H. T. M. Bell, Ed., 1905, p. 174 et seq.

5. Guide to South Africa; A. S. and G. G. Brown, Eds., 1897, p. 178.

6. de Kock, M. H., Economic History of South Africa, 1924, p. 247.

GOLD OUTPUT OF THE TRANSVAAL, QUANTITY AND VALUE, 1884-1910*

Year	Ounces Fine Gold	Value at £4.2477
1884.....	2,376	10,096
1885.....	1,414	6,010
1886.....	8,171	34,710
1887.....	39,880	169,401
1888.....	227,749	967,416
1889.....	350,909	1,490,568
1890.....	440,152	1,869,645
1891.....	688,439	2,924,305
1892.....	1,069,058	4,541,071
1893.....	1,290,218	5,480,498
1894.....	1,805,000	7,667,152
1895.....	2,017,443	8,569,555
1896.....	2,025,510	8,603,821
1897.....	2,743,518	11,653,725
1898.....	3,823,367	16,240,630
1899.....	3,637,713	15,452,025
1900.....	348,761	1,481,442
1901.....	258,032	1,096,051
1902.....	1,718,921	7,301,501
1903.....	2,972,897	12,628,057
1904.....	3,773,517	16,028,883
1905.....	4,909,541	20,854,440
1906.....	5,792,823	24,606,336
1907.....	6,450,740	27,400,992
1908.....	7,056,266	29,973,115
1909.....	7,295,108	30,987,650
1910.....	7,527,108	31,973,123

* Source: Transvaal Chamber of Mines, 37th Annual Report, 1926, pp. 96-97.

and England.⁷ However, difficulties were accumulating.⁸ Labor was scarce in spite of the 25,000 whites and 15,000 natives at work. No means other than oxen existed for transporting the heavy machinery and supplies over the hundreds of miles which separated the Rand from Cape Town. The richest part of the outcrop had been exploited and no one was certain whether deep level mines south of the strike would succeed. If they were possible, heavier and more expensive equipment would be needed and a much greater amount of capital to finance sinking shafts for deep mining. Methods of

7. *Economist*, December 22, 1888, p. 1605.

8. *Transvaal Handbook*, pp. 174-177.

extraction needed improvement; they were much too crude and wasteful for ore which contained perhaps only twelve pennyweights of gold to the ton. The speculative bubble was broken by the realization that many mines located on outside reefs could never be made to pay and that as the outcrop was exhausted deep level mining with all of its risks must be attempted. With its breaking, bankruptcy settled down upon the gold fields and South Africa as a whole in 1890.⁹ The banks had become heavily involved in the mining madness and several of the large ones were forced to close their doors.¹

Collapse of the boom of 1889 was shortlived and the production of gold increased even in 1890 and 1891. A general revival came in 1892 and with the restoration of confidence at home and abroad the industry was ready to enter its second stage. From 1892 progress was rapid. The deep levels were tested and found profitable requiring more capital and heavier machinery. Heavier stamps and better mining methods; the development and application of the MacArthur-Forrest cyanide process increasing the yield from low grade ores; the construction of railroads from the Cape to the Transvaal and thence to Delagoa Bay; the partial solving of labor difficulties with organized methods of attracting native workers — all these served to give the mines a new lease of life. Production was carried in 1895 to more than 2,000,000 ounces, valued at £8,500,000, of which £1,500,000 went to the shareholders in the form of dividends.

A general depression reappeared in South Africa in 1896 and continued to 1899, due partly to political factors and partly to a serious attack of rinderpest which destroyed much of the livestock.² But through all of these fluctuations, gold output steadily advanced, reaching a peak of 3,823,367 ounces in 1898. Then the Boer War brought a nearly complete cessation of mining until 1902. A post-war boom in industry was followed after 1903 by several years of depression, due largely to the scarcity of mining labor (met by the importa-

9. *Economist*, April 29, 1893, p. 170.

1. *Bankers Magazine*, London, May 1890, p. 1832.

2. *Ibid.*, September 1896, p. 638.

tion of Chinese coolies), but also, as will be seen later, to the changes accompanying South Africa's adjustment to an old debtor position.

The figures for mining output give perhaps too favorable a picture of the even advance of the industry after 1902; progress was not entirely unclouded, and indeed could not be otherwise for the individual mine or for the shareholders. Millions of pounds were lost by European investors in the great gamble to which they were lured by the extravagant stories and the unusual successes. Some companies did well; others, badly managed and poorly located, failed. The Wemmer mine starting with a capital of £10,000 in 1887 paid a 40 per cent dividend in two months.³ On the other hand, by 1900, fifty companies had been reorganized 190 times.⁴ Thousands of pounds were collected by promoters for a property on which no gold could be found in payable quantities; and when this obstacle did not appear, inexperienced management could easily bring large losses.⁵ Success demanded good location and abundant capital but also large quantities of ore carefully developed and stoped to minimize waste rock, powerful stamp batteries, and efficient recovery. Otherwise, rich tailings would carry away profits or small scale use of low grade ores would leave overhead uncovered.

CAPITAL IMPORTS AND THE EXPANSION OF SOUTH AFRICAN PURCHASING POWER

It has been seen that the initial step in the South African development is procural of adequate capital. Unfortunately in this most important feature of the analysis the facts are least available and most open to doubt. At best we can only make some good guesses. It should be remembered at the outset that the country itself was poor in capital for there had been little in the way of industry to produce it even in the older and more settled parts of the Cape. Also of importance in any estimate is the realization that while mining capital

3. Transvaal Handbook, *loc. cit.*

4. de Kock, *op. cit.*, p. 248.

5. Brown, *op. cit.*, p. 178.

itself will make up but a small part of the total, the industry was one to stimulate the whole country to new enterprise requiring large borrowings for railroads, harbors and municipal developments.

The most trustworthy information on the subject consists of an estimate made by Sir George Paish in 1911 according to which the aggregate British investment in South Africa to the end of 1910 was £351,368,000.⁶ We cannot judge whether this figure makes an allowance for capital sunk and lost, or for watered stock; nor is there any indication as to the amount of the investment prior to 1886. According to Nathan at least in the early days "infinitely more capital was sunk in unremunerative undertakings than was ever returned by way of dividends to shareholders."⁷ However, it may be accepted that the bulk of the £124,000,000 invested in governments, municipalities and railroads as well as the £131,457,000 in mines, iron, coal, and steel, apply to the years following the discovery of the Rand mines.

We have no data at all concerning the Continental investment. Paish specifically denies the statement of John Hays Hammond that ownership of the mines was vested chiefly on the Continent, with British interests a minority.⁸ According to Paish, "he had the good fortune of ascertaining through a mutual friend from the chairman of one of the greatest houses what proportion of the South African gold mining shares were held on the Continent and in London, and he was surprised at the smallness of the percentage held on the Continent."⁹ Whatever the truth may be as to the mining companies, it is probable that most of the remainder invested in other enterprises and in governments came from the English investor. Nathan states that while much of the initial capital was raised in England and France, German banks contributed a considerable quota, while German firms provided much of the

6. Sir George Paish, *Journal of the Royal Statistical Society*, vol. 74, 1910-11, p. 178.

7. Nathan, Manfred, *The South African Commonwealth*, p. 275.

8. *Engineering Magazine*, vol. 18, January 1900, p. 495.

9. *Journal of the Royal Statistical Society*, vol. 74, 1910-11, p. 197.

machinery.¹ If imports into the Cape of Good Hope are any indication, this last statement must be doubted. Machinery imports were mainly from England and the United States. The share holdings of residents of South Africa may be disregarded for the reason stated above. In 1917, shares had been brought home to the extent of only 14½ per cent.²

Taking all of the available evidence, it seems safe to estimate South African imports of capital from all sources between 1886 and 1910 at very nearly £400,000,000. This seems especially conservative when it is remembered that the country obtained most of its railroad net during these years, built a modern city, Johannesburg, and developed others, and opened dozens of copper, coal and gold mines. For each of the last named from £1,000,000 to £3,000,000 were required for shafts and machinery before an ounce of ore could be obtained.³ Certainly the sum was a vast one for a country so small economically, and great enough to produce changes of the first magnitude in her international and domestic affairs.

An equally important question concerns the timing of this capital movement. Again no certain evidence can be produced, tho it is clear that it followed the cyclical course of South African business. There were three great bursts of lending: the first in the years 1887-89 culminating in the crash of 1890; the second in the years up to 1896 when depression again appeared; and the third in the reconstruction period following the Boer War. There are several guides which may give fragmentary pictures of the movement. None can be more than the roughest approximation — and this not so much to the absolute amount of capital received from year to year as to the timing of the changes in the flow. Two of these indicators are given in the table below. The first is the amount of the annual capital applications in London by South African mines of all kinds, mainly gold. For certain years other South African borrowings are mentioned and

1. Nathan, *op. cit.*, p. 276.

2. League of Nations, *Memorandum on the Balance of Payments*, vol. 1, 1925.

3. Dawson, W. A., *South Africa*, 1925, p. 275.

these are stated for what they are worth. They make no pretense of completeness. The second is the new railroad mileage constructed annually — an indicator of sufficient significance to be also included.

CAPITAL APPLICATIONS IN LONDON
FOR SOUTH AFRICA AND GOVERNMENT RAILROAD MILEAGE
OPENED DURING THE YEARS 1886-1910

	Capital Applications*	Railroad Mileage†	
	Mines £	Other £	Opened Each Year
1886.....	.....	.....	44
1887.....	.....	.....	...
1888.....	.....	.....	...
1889.....	.....	.....	58
1890.....	.....	.....	362
1891.....	.....	.....	78
1892.....	.....	.....	501
1893.....	.....	.....	80
1894.....	.....	.....	178
1895.....	4,808,000	.....	161
1896.....	.....	.....	87
1897.....	2,960,000	.....	108
1898.....	1,744,500	.....	302
1899.....	3,070,900	.....	99
1900.....	1,944,400	.....	156
1901.....	975,000	.....	68
1902.....	7,047,800	.....	249
1903.....	1,347,100	37,202,300	358
1904.....	1,996,800	17,294,700	277
1905.....	4,271,800	9,386,200	625
1906.....	2,650,000	.....	489
1907.....	248,900	5,000,000	496
1908.....	2,828,400	5,000,000	263
1909.....	4,340,500	.....	79
1910.....	2,595,700	.....	...

* Economist, annual vols.

† Official Yearbook, 1910-1917, p. 640.

A less erratic and more complete series bearing on this question of the timing of the capital movement is that for the imports of machinery into the Cape of Good Hope. These figures are given on the next page.

IMPORTS OF MACHINERY INTO THE CAPE OF GOOD HOPE
 CLASSIFIED BY INDUSTRIES, 1887-1909
 (In £1,000)

Year	Total*	Mining†	Railroads	Other‡
1887.....	283	177	80	76
1888.....	356	199	124	33
1889.....	673	332	294	47
1890.....	1,097	280	733	84
1891.....	965	139	742	84
1892.....	874	190	564	120
1893.....	1,223	583	489	151
1894.....	1,117	649	319	149
1895.....	1,543	1,175	200	168
1896.....	2,766	1,480	1,052	233
1897.....	2,565	1,216	1,133	215
1898.....	2,044	834	919	290
1899.....	1,600	798	499	303
1900.....	1,511	292	974	245
1901.....	1,968	288	1,369	311
1902.....	2,851	532	1,632	687
1903.....	.....	.....	.....	.....
1904.....	3,194	467	1,611	1,115
1905.....	.....	.....	.....	.....
1906.....	1,102	402	282	417
1907.....	1,198	472	348	379
1908.....	613	270	73	271
1909.....	804	239	116	450

* Statistical Register of the Cape of Good Hope, annual vols., 1887-1909.

† Includes sawing and electrical.

‡ Includes agricultural and manufacturing.

The country was so undeveloped and the machinery imports were so largely for mines and railroads, both new industries and both borrowers, that some reliance may be placed in this evidence. It must be recognized of course that a considerable lag might exist between borrowing and the imports of machinery, that only a small fraction of the loans appear in this form and that some machinery was purchased without recourse to loans. Finally, the available data apply only to the Cape.

It will be seen that there was an immediate swelling in the mining machinery imports through 1889. After a considerable reduction in the years 1890 and 1891, the total again increases with very large additions in 1893, 1895 and 1896.

The smaller figure for 1897, tho well above those for the following years, might be interpreted as indicating a lag between machinery purchases and capital obtained by stock offerings. There is some conformity to the data for capital applications and more to the observations of all writers regarding the periods of heavy mining capital imports. The reduction in the imports after 1903 is difficult to explain, especially in the face of continuing large London capital applications. Perhaps an increasing amount of machinery was coming through the two important ports, Durban and Delagoa Bay.

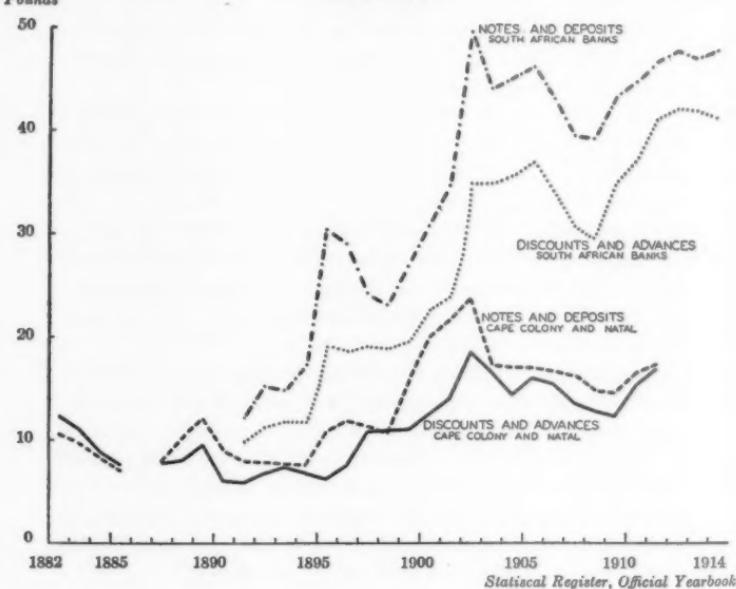
The totals for all machinery imports are mainly affected by the two major components, mines and railroads. It is apparent that the cycle in railroad building came from one to two years later than in mining and served to postpone the peak of all importations of machinery to 1890 in the first instance, to 1897 in the second and to 1904 in the third. It would be dangerous to press the use of such figures too far, for they represent a total value for all years of but slightly over £30,000,000. Nevertheless their trends show unquestionably the turning points in this process of importing over \$1,500,000,000 of capital in twenty years.

It has been seen that the first requisite of the mining industry was capital in large amounts. It is impossible to say how much of that obtained in the first months came from South African investors financed by South African banks and how much from the sale of shares in London, Berlin and Paris. Certain it is that the former source became negligible later, tho the banks took part in the first gold boom and surely much of the early capital must have come from such men as Rhodes and others interested in the diamond industry. So far as shares were sold in Europe, the producers were enabled at once to offer bills to South African banks, the latter thereby experiencing an expansion of their deposit or note liabilities or a drain of gold sovereigns into circulation which would require replacing from London balances. Much of the new capital was required to meet obligations for the purchase of supplies abroad but some part would be brought home for the payment of wages and other local expenditures.

A peculiarity of the South African case is found in the demand on the part of the Kaffir mine workers for payment in gold sovereigns. The gold was carried back with them to their native kraals, and this constituted the cause of a persistent drain of specie from the banks and of the need for constant replenishment from abroad. Thus we should expect to find that the stock issues occasion an almost simultaneous increase in bank credit, and then in coin imports as the banks sought to maintain their reserves against the native drain of gold, while exchange rates should show London exchange normally at a discount approximating the cost of shipping specie to South Africa. In other words, the classical theory of gold movements should find more complete verification here than in the cases of western nations such as Canada, where foreign

CHART I

SELECTED ASSETS AND LIABILITIES OF SOUTH AFRICAN BANKS
1882-1914



balances could be counted as a part of the reserve for deposits and note issue, or at least brought home only after a considerable credit expansion had occurred.

An increase in bank credit following immediately upon the gold discoveries is evident from Chart 1 which shows the total note and deposit liabilities of Cape and Natal banks. There were no banks in the Transvaal prior to 1888 and no data could be obtained for them or for the banks of the Orange Free State.⁴ From £7,771,000 in 1887, the total increased to £10,118,000 in 1888 and to £12,030,000 in 1889. During the same years, notes and bills discounted rose from £7,749,000 to £9,580,000.⁵ The chart also indicates the collapse which came in 1890-91 and the recovery from 1892. The omission of the Transvaal from the total for the earlier years quite certainly minimizes the expansion which took place during the first two periods of active investment. The upper line on the chart applies to all South African banks and displays a striking advance in 1894 and 1895. It is clear then that banking funds responded in the expected fashion to the new forces and provided the new industry with local purchasing power.

Chart 2 presents a picture of the specie movement in and out of the country together with the Cape Town buying and selling rates for sterling exchange. It is seldom that theory finds more certain verification than is apparent in this case. As has been stated, the nominal value of all the producing mines in 1889 has been stated as £6,800,000. In the years 1887 to 1889 inclusive, South Africa imported more than £4,000,000 in specie, nearly two-thirds of the total nominal capital of these mines. Furthermore there is no lag in the specie movement. Indeed, as will be shown more clearly below, specie seems regularly to have flowed in large volume before changes occurred in the trade balance.

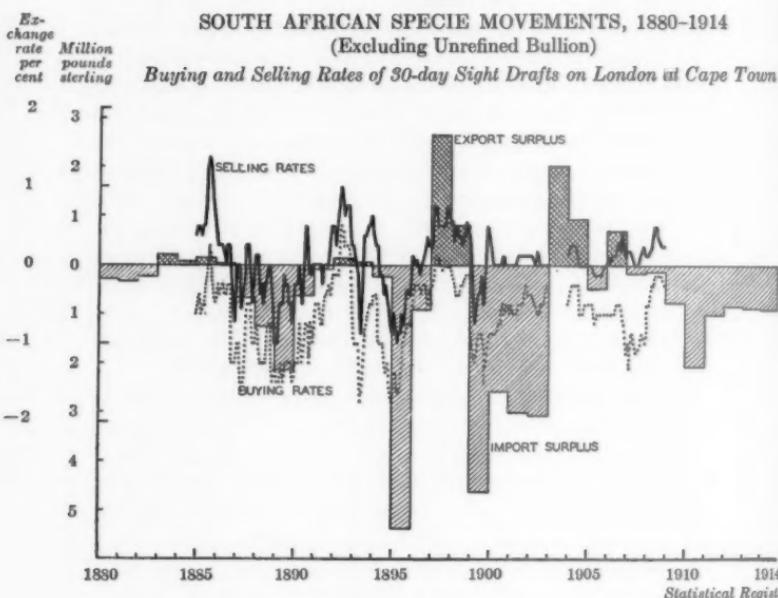
As soon as the first speculative bubble broke and investors ceased temporarily their gobbling of mining shares, the movement was reversed and a small outflow of specie appeared in 1892 and 1893. But it is left for the year 1895 to dispel all

4. de Kock, *op. cit.*, p. 374.

5. Statistical Abstract, Colonial Possessions, vol. 1886-1900.

doubts. The second cycle of investment culminated in recession in the latter part of 1895. In this last year of expansion, South Africa took over £5,000,000 of specie. It was to be expected that an inflow of capital would find some response

CHART II



in the movement of specie but seldom does the latter move in amounts corresponding even roughly with the former. Usually specie moves in driplets and often after other changes, not before them. The explanation must be found in the fact that wages were paid to the Kaffir workers in sovereigns and that this gold found its way into the native kraal where it was lost to circulation by hoarding or use for purposes of adornment. It was a cause for wonder in England that her new found gold fields could give promise of such richness and yet take more

gold coin from the mother country than they replaced with raw bullion.⁶

The Boer War was, in part, the occasion for the vast specie imports of 1899 to 1902. England was supporting an army in the country which required local supplies and labor. The continuance of the flow in 1902 is explained in part by the borrowing for reconstruction and in part by the expansion of mining activities which began at once. A collapse of the wartime boom occurred in 1903 leaving South Africa with a large import surplus. The gold industry was meeting serious difficulties in procuring an adequate supply of labor and neither in its output nor in its new capital could provide an offset to the imports of merchandise. Still more significant were the forces making for a permanent overturn in the trade balance which was soon to appear, as accumulating debt service came to exceed new capital. The result was an outflow of gold coin of large proportions in the two years 1903-4. In 1907, imports of coin again appeared and remained large until 1914. Taking the period as a whole, it is evident that the country was normally an importer of coin and this even in the face of growing invisible debits during the later years. It is also evident from the chart that the exchange rates reflect these influences.

6. London Bankers Magazine, vol. 49, 1889, p. 37. "As yet the gold which we thence receive in the rough is exchanged for gold and, to some extent, silver coin, which is from time to time withdrawn from the Bank of England and sent to these very gold fields in the form of coin, for the purpose of wage payments to the natives of the neighborhood. These natives naturally prefer coin to bank notes printed in a language unknown to them, supposing they could read any language. According to the Board of Trade returns, the exports of gold from the United Kingdom to South Africa during the eleven months ended November last have been £1,120,394 and imports thence for the same period only £758,845; and so the first effect of the great gold discoveries of South Africa has been rather to draw away gold from London than to add to our supplies."

See also *ibid.*, vol. 50, 1890, p. 1507. "For the last year or two, we in England have witnessed an efflux of coined gold to the Cape in excess of the production of gold on the spot. Never was there a better illustration of the effect of capital applied to industry. British capital in the form of coin was sent to pay the wages of natives, among other forms, and South Africa actually took more gold into circulation than was obtained from local mines, altho these mines were the main cause of the excitement which drew people to the spot and stimulated business there."

Sterling exchange sold at a discount in Cape Town during most of the period under review.

PRICES

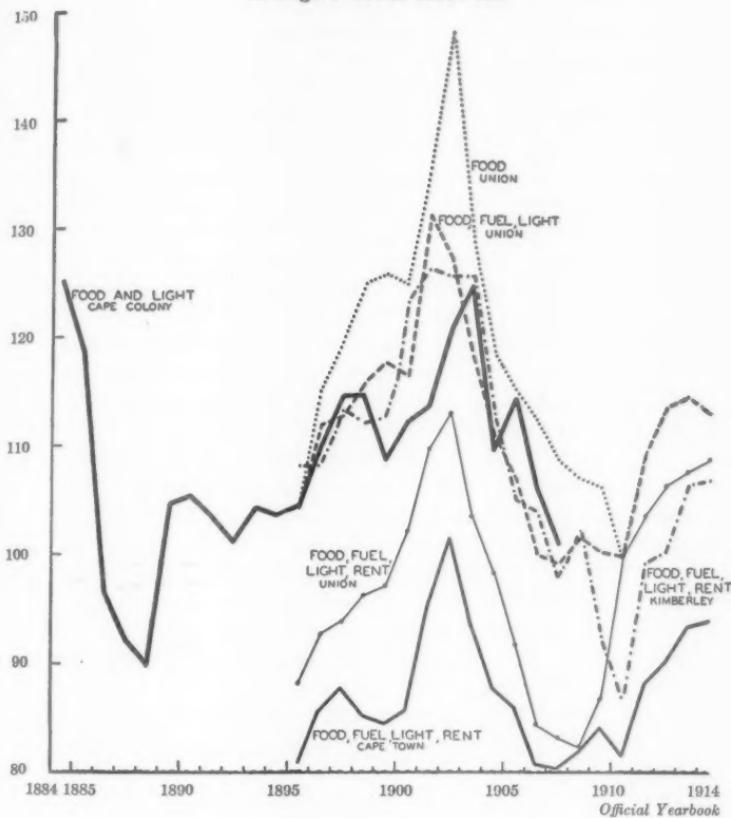
In theory, a country importing capital should experience rising prices. The same result follows for a country possessing a new industry in which her comparative advantage is great and for whose product the demand of other nations is intense. Both conditions apply in the present case and the expected results should follow.⁷ The forces making for rising prices have been shown to have been present — specie imports; expanding bank credit; an active demand for foods, materials and labor; a relatively inelastic producing equipment unable to flood markets with great additional supplies in any short period of time. To suppose, however, a general rise of prices runs counter to modern theory.

Quite a different question from that of the general rise in prices is that of the changes in the prices of different classes of goods. It has been shown repeatedly that trade adjustment, when equilibrium has been disturbed, could only take place if different categories of prices are differently affected. More specifically, we should expect a relative rise of domestic prices; a relative decline in the prices of imported commodities; while export prices, fixed in a world market, might remain stable, or rise less rapidly than domestic prices if the exports constitute a large share of the world supply and if the demand for them is inelastic.

In the Official Yearbook of the Union of South Africa, index numbers are presented for retail prices for the years back to 1895. They have been carefully computed and appear to be trustworthy. They leave us quite in the dark, however, regarding the critical years of the first two speculative cycles. The writer has computed a weighted aggregative index of the prices of thirteen foods for the years 1883 to 1907, data for which are to be found in the old Statistical Register of the Cape of Good Hope. The figures are average prices for the towns of the Cape and there is no independent means of judging

7. See F. W. Taussig, *International Trade*, 1927, chapters 7 and 12.

CHART III
DOMESTIC PRICE INDEXES—CAPE COLONY
Average 9 Towns 1910 = 100



ing their accuracy. It is realized that the choice of foods at retail as the components of an index to measure the changes in domestic prices, leaves much to be desired. The weights employed were those used by the Union statistician and are proportionate to the amounts of these foods in the budget of an average working family. The year 1910 was chosen as

base. An overlapping period of thirteen years between the two indexes gives an opportunity to check this rather crude measure of price changes.

The new index, together with those computed by the Union statistician, is presented in Chart 3. Apparently domestic food prices fell sharply to 1886, somewhat more slowly to 1888. Then there set in a rapid rise which carried the index from 90 to 105 in 1889. A slight decline coincides with the business recession but the upward trend was resumed in 1893 and continued to 1898. From 1899 to 1902, war-time inflation is apparent, followed by a precipitate decline to 1908. The two indexes show a fairly close correspondence through the overlapping years.⁸ There can be no doubt here as to the harmony between theory and the experience of South Africa. Domestic food prices did respond in the expected fashion and the country was snatched out of the worldwide deflation of the last quarter of the nineteenth century fully six years before the world at large felt the stimulus of the new gold.

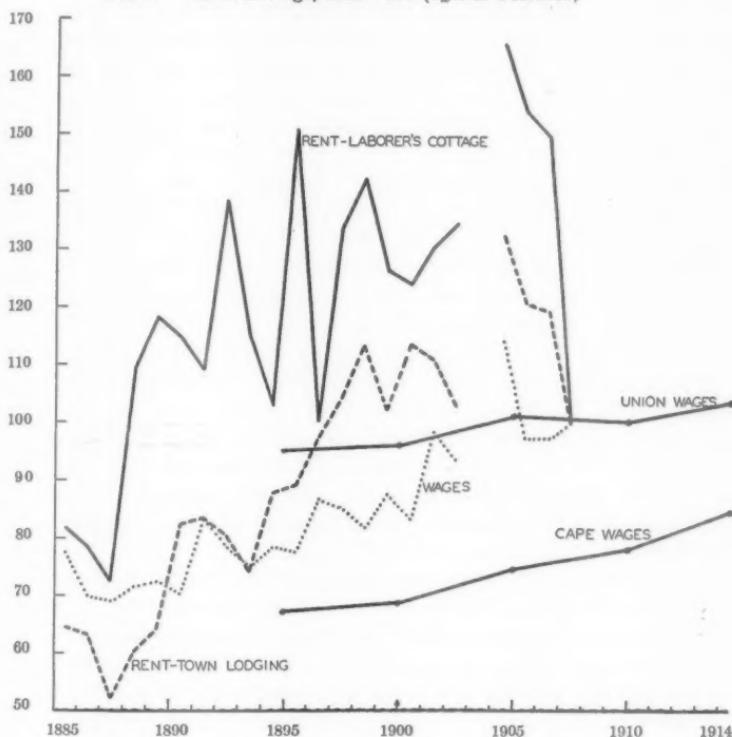
To provide some further strength for the contention that South African domestic prices rose sharply under the influence of gold, a very crude index of house rents has been computed from material given in the same source. Quotations were presented in the Register for the rent of a town lodging and for that of a laborer's cottage in six Cape Colony towns. A simple unweighted average was taken and related to the year 1907 as base. The results for both series are shown in Chart 4. The indexes are very rough measures and the original data cannot be vouched for. Nevertheless, the same story is told in even more striking language. From 73 in 1887 the index for the rent of a laborer's cottage rose to 118 in 1889. In the years following, tho highly erratic, it rises to 151 and never falls below 100 to the end of the decade. The town lodging index is less variable but traces the same trend. From 52 in 1887, it rises almost without interruption to 113 in 1898.

Had world prices been stable, the prices of imported com-

8. The commodities included were the following: oatmeal, flour, bread, mutton, beef, butter, cheese, tea, coffee, sugar, rice, milk, candles and potatoes.

CHART IV
WAGES AND RENTS IN CAPE COLONY TOWNS

Wages — Weighted average of 3-6 towns for 11 occupations, 1907 = 100
 Rents — Town lodging — 6 towns, 1907 = 100 (*Statistical Register*)
 — Laborer's cottage — 6 towns, 1907 = 100 (*Statistical Register*)
 Quinquennial indexes of wages, 1895-1914 (*Official Yearbook*)
 Cape — Union average, 1910 = 100 (*Official Yearbook*)
 Union — Union average, 1910 = 100 (*Official Yearbook*)



modities might have remained the same absolutely, the falling relative to those for other classes of commodities. The world deflation which set in during the seventies should have changed all this and made it possible for South Africa to pro-

cure her imports on steadily better terms, at least until the new gold began to influence prices in other countries.

To measure the changes in import prices presented difficulties, for no price data existed for the more important imports. Again the statistical records of the Cape provide a means of escape. In each annual volume of the Register, data are presented for the quantity and value of many of the important articles of merchandise imported and exported annually from 1883 to 1909 for the Cape of Good Hope. The first step was to obtain average annual prices by dividing the value figures by the quantities for seventeen of the most important imports whose combined values made up a large share of the total imports.⁹ These average prices were weighted with the quantities of each commodity imported in 1907, and an aggregative index computed with 1907 as base. In the four years 1883-86, complete data could not be obtained and the components of the index were reduced to ten. This lack of homogeneity must be remembered in judging the index. The procedure produced the curve shown in Chart 5.

The sudden activity in the country seems to have caught the importers shorthanded, and the line rose in 1887 and 1889. From the latter year, however, the trend was downward, the index falling from 124 in 1889 to 91 in 1899. Thereafter, the course is nearly horizontal tho a slight drift upward is noticeable to 1909. This movement indicates the reaction of world prices to increased supplies of gold and the closing of the gap between South Africa and other countries.

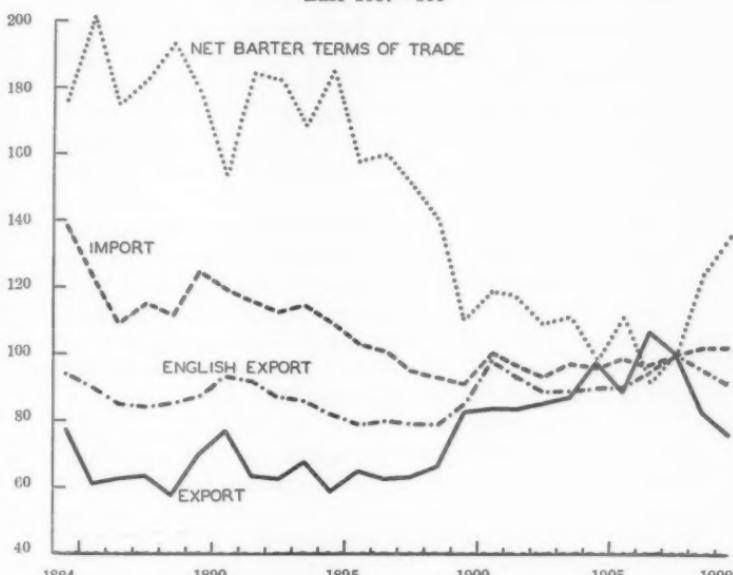
To strengthen these conclusions, the data for English export prices have been included on the same chart. Here the downward drift is much less marked, the total decline amounting to only fourteen points or from 93 to 89. The two curves are roughly parallel, tho the English index is the more stable, perhaps because of the inclusion of a much larger list of commodities. From 1899 to 1909 the coincidence is much closer.

9. The imported goods included were as follows: ale and beer, candles, cement, coffee, flour, dynamite, oil, soap, sugar, tobacco, unmanufactured wood, bar iron, corrugated iron, preserved meat, steel bars, cotton hosiery, bags and cotton piece goods.

CHART V

IMPORT AND EXPORT PRICE INDEXES AND NET BARTER TERMS OF TRADE FOR SOUTH AFRICA, 1884-1909

Base 1907 = 100



English Export Price Index from F. W. Taussig,
Principles of International Trade. Base shifted to 1907 = 100

The principal South African exports consist of commodities of a pastoral, agricultural or extractive character. Diamonds, ostrich feathers, wool, hides and sheepskins make up a very large part of the total value exported each year. Of course gold bullion soon came to exceed all of these by many fold. Of the commodities enumerated, it will be seen that only two, diamonds and feathers, can be said to have world prices mainly dependent upon conditions in South Africa and one of these, diamonds, is in the control of a monopoly. The other did not become an important export until after the Boer War. Unless these two were affected by unusual conditions of over-

supply within the industry or by a declining demand abroad, the rising wages and other costs should have produced an upward trend here as well as in the specifically domestic goods. Regarding the others, it may be pointed out that the South African exports constitute but a small part of the world supplies of wool, hides, skins, copper and angora hair. Here the declining world price level would make any considerable rise due solely to local factors impossible. Moreover, being basic raw materials, the forces making for a decline in world prices might be stronger for these than for goods of a manufactured character.

In any case, export prices should have risen much less than domestic prices and, caught between the two forces of rising costs and a falling world market, might have remained fairly stable. The export price index was computed in the same manner as that for imported goods. Ten commodities were included, the weights were the quantities exported in 1907 and that year was used as the base. The index is plotted on Chart 5. No trend is evident for the years 1887 to 1898; the curve moves horizontally. Fluctuations are apparent in conformity with the cyclical expansions and contractions of the period, but exports neither rose in price, as did domestic goods, nor did they fall along with imports.

After 1899 a new alignment appeared but the forces producing it are too complex and entangled to unravel completely. The flood of gold brought rising world prices after 1896, and we should look for a decline in South Africa's advantage as the purchasing power of the mining product fell and the costs of supplies rose. Furthermore, after one more burst of capital imports in 1903 and 1904, the balance of trade turned definitely in favor of South Africa in 1905. Invisible debits came to exceed fresh capital. The forces which produced the earlier relation of the three sets of prices might now be reversed and as import prices turned up, domestic prices might fall or rise less rapidly than world prices while exports should follow a midway course, rising more than domestic but less than import prices.

Important complications make it difficult to test this hy-

pothesis. South Africa passed through a war-time inflation which carried domestic prices to a very high level, and this condition was normally followed by a severe recession from the war peak, lasting at least through 1908 as is clearly shown in Chart 4. On the other hand, the mining industry proved not to be hindered by less favorable conditions for production. Great strides were made in the application of more efficient methods and working costs fell greatly, which should normally have maintained the former advantage and postponed the day when the price changes enumerated would have taken place. Let us study the actual changes.

An excess of imports in 1902 to 1904 bears out the statement that the inward movement of capital was heavy. Recession gradually took form in 1903 throughout the country and a considerable drain of specie appeared during that year and the next. Three reasons may be assigned for this. One was that the war-time speculative expansion had now given way to deflation. Another is found in the struggle of the mines to procure the necessary supplies of labor, which made itself felt everywhere, creating uncertainty and loss of confidence.¹ Lastly the rapid growth of debt service and other invisible imports gradually cut down merchandise imports and produced an export surplus in 1905 which lasted until the World War. Domestic prices turned down about 1903 and fell rapidly until 1909. Import prices started up about 1900 and rose steadily but gradually. Assisted by their price determination in world markets and by the fact that raw materials prices generally rise more than manufactured goods, the export index continued to move upward in a jerky fashion until 1906. Then it too fell along with other prices until 1909. On the whole the period is one of declining prices at home with rising prices abroad, a condition typical of a debtor nation in its later stage.

Recovery set in in 1909 and prosperity was prevalent to 1913. It seems likely that these last years, with their rising prices, expanding gold output and spirit of optimism, brought

1. Goodfellow, D. M., *A Modern Economic History of South Africa*, 1931, pp. 214-215.

something of a return of the old boom days. The gold mines were rapidly installing improved technique, cutting costs and improving recovery. But how far this operated to overcome the country's disadvantage found in the necessity for shipping large volumes of goods at low prices to pay debts cannot be answered.

MONEY INCOMES

One step more must be taken before we shall be prepared to turn to South Africa's trade and balance of payments. Nothing has been said thus far regarding the changes in money incomes following the mining developments. Following the analysis of Professor Taussig, we may say that a country enjoying a great comparative advantage in production, one whose products are desired intensely by other nations and one in the early stages of importing capital will have high and rising money incomes. The higher incomes serve to stimulate purchases of lower priced foreign goods and provide the means whereby a higher standard of living may be enjoyed through the greater command over these goods. All this is now familiar to the student of international trade.²

In his study of Australia, Cairnes showed how the ability of an ordinary laborer to obtain the equivalent in gold of a sovereign for a day's work on the gold fields, set a standard for the whole country, lifting wages to a very high level, increasing the cost of producing domestic goods and bringing large adjustments in Australia's trade.³ The outcome was an obstacle to exportation and the substitution of foreign supplies for the goods formerly produced at home. It is clear that no such direct result could be anticipated for South Africa. Gold mining there could not be conducted by the individual working independently and earning as wages the gold he could find. This was a large scale business employing thousands of workers, some unskilled, many in the higher grades of manual or mental work. But the result was the same — men could not be lured from comfortable and civilized communities to the hardships of deep mining on the

2. F. W. Taussig, *op. cit.*, chs. 4-5.

3. J. E. Cairnes, *Essays in Political Economy*, 1873, p. 22 et seq.

bleak and windy plateau of the Witwatersrand unless the reward was great. Too, a standard had already been set at the Kimberley diamond mines of twenty shillings for a ten-hour shift.⁴ White gold miners would not work for less.

Had these conditions held for all laborers, however, it is safe to conclude that no Rand mining industry as it is known today would ever have been developed. South Africa's comparative advantage would not have appeared. The costs of mining low grade ores would have been prohibitive. What made the Rand possible was the fact that the Kaffir worker could be employed for not over £50 per year or \$.75 per day, of which £30 was in cash and the remainder in food and housing.⁵ Indeed, Worsfold contended in 1912 that, had the native laborers (then more than 180,000) been replaced with European workers, the annual bill for unskilled workers would have been twice the value of the production and six times the net profit.⁶ It is indisputable that the mines were saved by the services of a non-competing group of black workers. The result of their availability was to limit the demand for white labor to the numbers necessary for work demanding skill and intelligence. Masons, carpenters, engineers, metallurgists and clerks found ready employment and received a high reward. Whites who offered nothing but their strength found little place, for they could not compete with the "boy." In fact they could hardly subsist in the Transvaal on the 25 shillings a week paid them in 1886—and this in the early days before prices had reached their peak.⁷

Not only were the wages paid to white workers high but one writer after another declares them to be the highest in the world for similar work. This view was held by Mr. E. P. Rathbone, sometime government mining inspector, writing in the *Economist* in 1896.⁸ The same opinion was expressed by Mr. Samuel Evans in 1925 who, quoting the Chapman

4. Kemmerer Report, *op cit.*, p. 60.

5. W. B. Worsfold, *The Union of South Africa*, 1912, p. 324.

6. *Ibid.*

7. *Economist*, 1886, p. 1194.

8. *Ibid.*

Commission of 1914, maintained that they were 40 per cent higher than in the United States, 69 per cent higher than in Australia and 225 per cent above those of any European country.⁹ Even the 2s 6d paid the black worker was high — sufficient to draw his kind in thousands from agriculture and other occupations in which his services were sorely needed.

It must not be concluded that high money incomes indicated necessarily high real incomes and a correspondingly great effectiveness in producing gold. All writers attest the fact, which cannot be verified for the earlier years, that the cost of living was very high in the Transvaal, made so in part by the high wages paid other workers in South Africa and partly by the long haul by sea and overland to the point of consumption. The mine worker gained little from high wages in his consumption of domestic goods. What he might have gained when consuming foreign goods was in part wiped out by the high transportation charges and the concessions and monopolies with which he was beset before the Boer War. Some net gain there was, but it was reduced by these factors.¹ Where £1 16s would provide food and lodging for an English worker even in 1913, £3 9s 6d were required to bring the same enjoyments in the Transvaal.²

The high money wages in the Transvaal mining industry were due in part, as has been shown, to the special influences existing there. They could not exist, however, without profoundly affecting the remuneration of workers throughout South Africa. Prices rose and credit expanded, as we have seen, with the new gold. White and colored laborers were drawn to the gold fields from great distances, increasing the difficulty of getting help in other parts of the country and driving up wage rates and money costs of production.³ In

9. Kemmerer Report, *op. cit.*, p. 60.

1. Samuel Evans, Report of the Annual Meeting of Crown Mines, Ltd., June 1, 1922, pp. 5-6.

2. V. R. Markham, *The South African Scene*; London, 1913, p. 303.

3. Samuel Evans, *ibid.* "I have on previous occasions urged that the slow development of the rural parts of South Africa is attributable in no small measure to the unduly high rates of pay and working conditions which prevail on the Transvaal. A standard is set which necessitates

1896 there were approximately 8,000 white workers and 54,000 blacks on the Rand; in 1909-1910 the numbers had increased to 22,000 and 174,000 respectively.⁴ From a population of 119,000 whites and an unknown number of natives in 1890, the Transvaal grew until it contained 297,000 whites and 973,000 natives in 1904.⁵

Index numbers for wages in the Union of South Africa for quinquennial periods from 1895 to 1910 and annually thereafter are presented in the Official Yearbooks. Again, it was necessary to supply the deficiency for the early years. The Register, previously mentioned, presents data on daily, weekly and monthly wage rates in several towns of the Cape and for a large number of occupations for each year from 1885 to 1907. There is no way in which the methods of collection or the general representativeness of the figures can be checked and in many occupations serious gaps occur in the quotations. Nevertheless, an index has been constructed which may show in general the changes in wages from year to year in the Cape of Good Hope. Eleven occupations were chosen, including such representative employments as stonemason, carpenter, painter, tailor, farm overseer, day laborer and domestic servant. It was found impossible to weight the wages paid in each town by the numbers receiving them as no such weights were available. Simple averages were therefore computed for from three to six towns for each occupation annually, and the several occupations were combined using as weights the numbers so occupied as given by the census of 1891. Unfortunately no wage data were given for 1910, and hence it was not possible to place the index on a base comparable to that of the published index. The year 1907 was used as base.

The results are shown on the same chart with the index of rents, Chart 4. Wages, according to this unrefined index, increased slowly but steadily from a low point of 69 in 1887 excessive railroad fares and an extravagant scale of expenses generally for the farmers and the other inhabitants of the Union."⁶

4. Brown, A. S., *op. cit.*, p. 137.

5. *Quarterly Abstract of Union Statistics*, No. 1, 1920.

to a peak at 98 in 1901. A similar movement is indicated for the period 1895 to 1905 by the official index. The annual variations in the index for the Cape are small but seem to conform to the cyclical fluctuations of other indexes. Like prices and rents, South African money incomes seem to have responded to the combined influence of capital imports and a new gold industry in the anticipated fashion.

Gold has always lured the foot-loose and discontented of all countries, and after 1887 South African immigration set in on a large scale, at least large for the time and place. The data are admittedly inadequate and ambiguous, for no statistics on immigration were published before 1903. The early records of the Cape give numbers entering and leaving at Cape ports, but one cannot be certain that exits for one colony were not entrants for another. Furthermore, the absence of data for Natal and Lorenzo Marquez is a serious omission. The figures given below are for the net immigration to Cape Colony by sea and may be used only to indicate

CAPE OF GOOD HOPE ARRIVALS FROM AND DEPARTURES FOR
THE UNITED KINGDOM AND THE AUSTRALASIAN COLONIES BY SEA
1887-1904*

Year	Arrived	Departed	Net
1887.....	3,653	2,763	890
1888.....	.....	.....	.....
1889.....	9,550	4,301	5,249
1890.....	8,827	5,862	2,965
1891.....	7,784	5,026	2,758
1892.....	8,892	5,234	3,658
1893.....	12,770	5,808	6,962
1894.....	15,360	7,441	7,928
1895.....	23,920	8,726	15,194
1896.....	34,079	13,809	20,270
1897.....	25,151	16,045	9,106
1898.....	21,528	15,328	6,200
1899.....	16,365	21,478	5,113
1900.....	19,443	12,350	7,093
1901.....	21,053	22,352	1,299
1902.....	35,931	12,971	22,960
1903.....	46,618	20,082	26,536
1904.....	24,238	23,748	490

* Sources: Statistical Register of the Cape of Good Hope, Annual Volumes.

the general trend of the movement toward South Africa. It can hardly be doubted that the strong upward trend throughout the nineties was in direct response to the movement of wages and to the attraction of the gold mines. It is probable that the figures show the general drift for the country as a whole.

In any case, it is clear that South Africa did attract the factor of production labor just as strongly as capital and that a static analysis resting upon an assumed immobility of the factors would be quite unreal. The new labor and capital would necessarily bring changes in the effectiveness of South African production, narrowing the spread between her conditions and those abroad.

SOUTH AFRICAN TRADE AND THE BALANCE OF PAYMENTS

In turning to the study of the imports, exports and the balance of payments, it may be well to recall again the forces operating upon South Africa and the results which theory would suggest. If we consider the evolution of the gold industry alone, disregarding the country's invisible trade including capital imports, the situation is comparable to any one of numerous cases of the acquisition of a new and great comparative advantage. An industry is created in which the effectiveness of labor is greater than in other occupations, one which is able to pay a high return to labor and yet place its product on the market at prices below those of its competitors. It is true, of course, that in this case the selling price of the product was relatively fixed for all alike by the buying price of the Bank of England. At first the new export creates a flow of payments toward the producer not balanced by imports. As new purchasing power is received from these exports, prices rise and with them money incomes. Other industries feel the new pressure of competition for labor and the rising costs of domestically produced raw materials. Imports are stimulated with the increased buying power of the individual and exports other than the new product are hindered. A new balance is finally struck and the country finds itself enjoying an increased trade, an increase in real

income as purchasing power is expended for foreign goods, higher money incomes and higher prices.

Of course, the new industry being the mining of gold, some peculiarities are present. Since the product is itself the basis of money and credit, while its own price in money is fixed, the prices of all other things are gradually raised and its price in those things falls as its supply increases. While other industries experience falling prices of their products and fairly constant money costs when they overproduce individually, the mining industry experiences a fixed money price but a falling goods price and rising costs of production. With its durable, accumulating product, the gold industry, when profits are large, is perhaps more likely than others to produce in excess of the world demand for its product as measured by the volume of trade and production. World prices rise, the purchasing power of gold sinks, and unless there are improvements which will offset the rising costs, output is certain to be curtailed as marginal mines become unprofitable. South Africa was almost certain to lose her advantage in time unless great improvements could be developed. When this stage was reached a reversal of the forces enumerated would appear, trade would shrink, non-gold exports expand, imports decline and the country would lose some of her former gain from trade.

The effects of capital imports are familiar to all and have been described at an earlier point in this discussion. The effects are much the same as those just detailed. They should intensify the growth of imports and their later repayment should offset any help against rising world prices which improvements in the mining industry's technique might produce. They should combine with a declining advantage to increase exports relative to imports.

Again there is a peculiarity to be noted in South Africa's case. Mining capital was obtained mainly through the sale of shares abroad, few debentures being issued. A part of the proceeds was absorbed as promotion profits and would not enter the international account at all. Part of the remainder was taken in gold sovereigns, reducing further the necessary

surplus of imports. On the other hand, the capital imports were superimposed upon a debt paying stage which had already resulted from the financing of the diamond industry in the preceding decade with the accompanying stimulus which had given to railroad building and other improvements. Finally, large dividends were paid annually by the mining companies and this invisible import would help to offset the inward movement of capital. For these reasons, it is not necessarily true that South Africa would experience an immediate and large import surplus. An interruption in the rising tide of exports there should be, comparable to that of the United States during the eighties of the last century before the trade balance became definitely favorable. On balance, then, these forces should bring a variable condition, exports rising in periods of business stagnation or recession, imports in periods of boom, a clear surplus of imports appearing only when fresh capital exceeded debt service and other invisibles.

Turning now to the trade statistics which are presented graphically in Chart 6, it will be seen that until 1883, South Africa was in the position of a young debtor nation. Imports exceeded exports by from £1,000,000 to £2,000,000 each year during the decade before 1884. In that year the balance turned to one favoring exports and for the next five years the country was engaged in shipping out more than she received in order to pay for invisibles such as debt service and shipping charges. It was thus in the position of an old debtor that the country entered upon its career as a gold producer on a large scale. During all of the six years preceding 1886 there had been no great growth in either exports or imports. The trends were horizontal. Beginning in 1887 both began to rise rapidly and, omitting the Boer War period, there was no reduction in the pace before the World War.

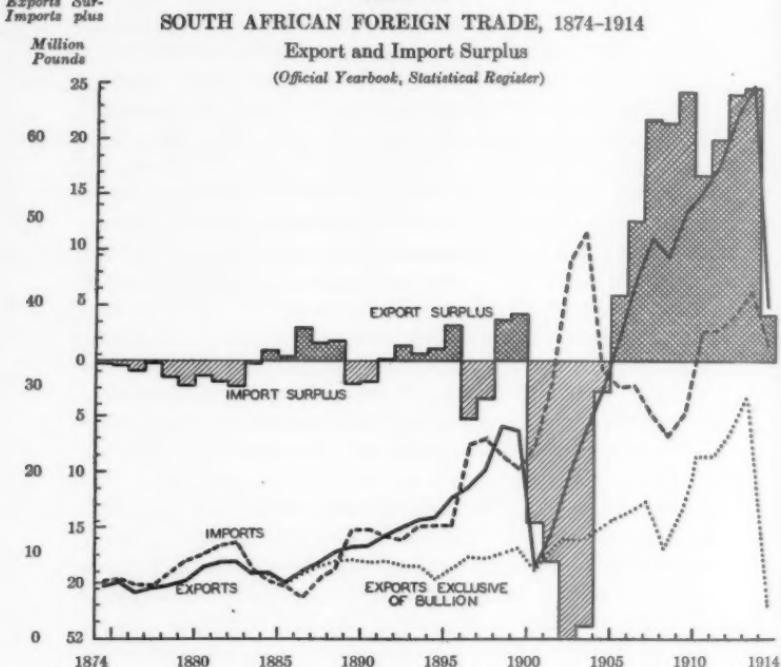
It is a matter for some surprise that, in spite of the supposed large acquisition of capital, the exports and imports so nearly balance in the years up to the Boer difficulties, and still more so that an export surplus appears more frequently than an import surplus before 1900. The only possible expla-

CHART VI

SOUTH AFRICAN FOREIGN TRADE, 1874-1914

Export and Import Surplus

(Official Yearbook, Statistical Register)



nation is that the country had great invisible debits which were met in part out of new capital.

Yet in the critical years, the periods of business prosperity and optimism, when the greater part of the capital was obtained, the imports did grow more rapidly and came to exceed the exports. This was true of 1889 and 1890, of 1896 and 1897 and of 1903 and 1904. The lag of imports which brought the continuance of the surplus into the first year of depression is reasonable, for fresh funds would not be expended at once, while South Africa's exports of raw materials and foodstuffs would of course shrink rapidly where depression in South Africa coincided with similar conditions abroad. When the considerations mentioned above are recalled,

namely, the large imports of specie, the accumulation of old debt charges and the immediately large debits for dividend payments, the smallness of the import surplus even in the boom years is not remarkable. Again, the oscillatory movement of capital importations is evident. Speculation ran rife upon unfounded rumors at certain periods, bringing with it a willingness to buy any share which contained the printed word gold. Capital poured in until the impossibility of extracting gold on outside reefs together with the misuse of funds by promoters sapped confidence and dried up the stream. Then, debts remaining to be paid with no counterbalancing capital credits, imports contracted and an export surplus appeared.

The Boer War period witnessed a remarkable expansion of imports while gold production and exports fell. In large part the inward movement represented the shipment of supplies to troops. It has nothing to do with either the gold industry or the import of capital, for both virtually ceased. Recovery began after 1902; for two years capital and imports poured in to aid in the work of reconstruction. Then, following 1904, a tremendous surplus of exports appeared, continuing and growing without interruption until 1914. South Africa definitely entered the stage of an old debtor nation. From 1907 to 1913, the export surplus reached the surprising figure of £20,000,000 annually.

At this point as in most studies of earlier periods, we are at a loss for the facts regarding the country's balance of payments. Nothing at all is known of the individual items for any of the earlier years. In the Kemmerer report of 1925, Mr. A. W. Carruthers has presented condensed figures for the balance sheets for the years 1917 to 1923.⁶ Unquestionably these figures are influenced by the World War. Nevertheless there is a good deal of stability in the various items and they should throw some light on the general conditions which must have existed in the earlier years. Perhaps the most obvious conclusion to be drawn from them is that the country's invisible debits far exceed the credits from invisible

6. Kemmerer Report, *op. cit.*, Appendix 9, p. 478.

exports. In 1917, one debit item, dividends, exceeds by 100% the total of the invisible credits. Heavy expenditures were necessitated for debt payment and interest, freight and insurance and expenditures of nationals abroad. These with dividends made up a total in that year of £23,098,000 or nearly half of the export surplus of £53,362,000. In 1918, the same items totalled £21,959,000 and exceeded the export surplus of £19,309,000. Finally, taking 1923, the figures were £24,251,000 and £23,525,000 respectively.

Dr. M. H. deKock has given some figures which he presents as a sort of rough average balance sheet for the years 1910 to 1923. These show that the Union, tho still importing capital to the amount of £4,000,000 to £10,000,000 per year, was a debtor on account of interest, dividends and profits alone to the amount of £16,000,000 to £20,000,000 annually.⁷

It is now possible to deal briefly with the changes in the barter terms of trade. The gross barter terms cannot be measured by the methods used by Professor Taussig.⁸ Gold bullion must be included as a merchandise export. No index of quantities can be computed directly for exports and imports as a whole, since complete quantity data cannot be obtained. On the other hand, changes in quantities cannot be measured by dividing value data by export prices, since an export price index which included gold bullion at its rather fixed price would show very little variation, while the omission of gold would leave the index meaningless.

Changes in the net barter terms, however, can be measured by means of the export and import price indexes already mentioned. It must be noted that in these indexes no allowance has been made for such invisible imports as shipping and insurance services or the benefits acquired by South African nationals sojourning abroad. The import and export price indexes together with their quotient, the net barter terms, are given below. A rising index indicates a lessening of the advantage for the nation while a decline marks the accrual of greater benefits to South Africa.

7. de Kock, *op. cit.*, pp. 329-332.

8. F. W. Taussig, *op. cit.*, ch. 21, pp. 249-252.

IMPORT AND EXPORT PRICE INDEXES AND THE NET BARTER TERMS OF TRADE. 1884-1909

Year	1907 = 100		
	Export Index	Import Index	Net Barter Terms
1884.....	77.8	138.6	176
1885.....	60.9	123.2	201
1886.....	62.2	108.9	175
1887.....	63.2	114.9	182
1888.....	57.7	111.6	193
1889.....	69.9	124.5	179
1890.....	76.5	119.4	154
1891.....	63.2	115.8	184
1892.....	62.4	112.7	182
1893.....	67.6	114.5	169
1894.....	58.8	109.4	185
1895.....	64.6	103.1	158
1896.....	62.5	101.2	160
1897.....	63.1	94.8	151
1898.....	66.1	93.0	141
1899.....	82.3	91.8	111
1900.....	83.5	100.2	119
1901.....	83.1	96.5	117
1902.....	85.1	93.4	109
1903.....	86.9	97.3	111
1904.....	97.8	96.1	98
1905.....	88.8	98.5	111
1906.....	106.7	96.7	91
1907.....	100.0	100.0	100
1908.....	82.3	102.1	124
1909.....	76.0	102.1	135

Examination of the index confirms the suggested changes in capital flow and the debtor position of the country. In 1889 and 1890, the movement was sharply downward indicating the improvement in the country's position as capital flowed in. After the temporary reaction in 1891, the barter terms reflect the steady borrowing which proceeded during the remainder of the decade. The index responded sharply to the war time inflation and continued to drift down in the years following the war to 1907. On the whole, South Africa exchanged her exports for imports on dearer and dearer terms, the years 1904 to 1906 marking the high water mark of her advantage. In 1907 a change occurs which coincides

roughly with the change in her trade balance and the payment of heavy liabilities on invisible account. It is apparent, looking at the period as a whole, that the net barter terms conform in their movements to theory and to the known facts of South Africa's international dealings.

COMPARATIVE ADVANTAGES AND DISADVANTAGES

It would be easy when looking at the curve marked "exports exclusive of bullion" on Chart 6, and when studying the trade and production statistics, to reach a hasty conclusion regarding the influences of the mining industry. There appears to be a clear repetition of the conditions which Cairnes described for Australia; at first, an increasing difficulty for domestic industries which possessed a smaller advantage than did gold production, and then a gradual shift of commodities from the list of exports to that of imports; later, a reversal of these conditions with an increase of non-bullion exports. The curve is horizontal between £9,000,000 and £11,000,000 during all of the last decade of the century, while from 1903 to 1912 its rise is rapid except for a temporary break in 1908 and 1909.

In the table on the next page, the quantities of certain specified imports and exports by sea for the Cape of Good Hope are shown for selected years. Several qualifications must be borne in mind in judging them. They contain a certain indistinguishable amount of inter-colonial trade. No figures could be procured for the trade through Portuguese East Africa by way of Delagoa Bay, which certainly handled a considerable share of the Transvaal business after the opening of the railroad in the nineties. The years selected hardly give a fair comparison, since 1890 was a year of general recession; 1895 a year of prosperity; 1899 contained the outbreak of war in October and succeeded two years of political uncertainty and fear; while 1909 marked the beginning of revival after several years of depression.⁹ It is believed, none the less, that they indicate the major trends of the period.

9. W. L. Thorpe, *Business Annals*, 1926, p. 308 et seq.

SOUTH AFRICAN EXPORTS AND IMPORTS FOR SELECTED YEARS*

(All figures in thousands)

Exports	1890	1895	1899	1905	1909
Coal, coke, tons...	149	211	329	667	1,109
Hair, lbs.....	9,782	11,518	13,490	11,867	19,649
Hides, no.....	466	544	265	4,155 ²	11,607 ²
Feathers, lbs. ¹	212	354	373	471	788
Skins, no.....	4,855	4,355	4,118	19,735 ^{2,3}	32,045 ²
Wool, lbs.....	92,436	85,084	69,725	77,186	130,960
Fish, lbs. ¹	2,419	1,097	984	95	1,321
Diamonds, carats..	2,506	3,622	2,737	3,462	4,943
Imports					
Candles, lbs. ¹	1,947	7,357	3,947	5,424	2,600
Butter, lbs.....	658	2,458	5,796	12,548	5,250
Cheese, lbs. ¹	1,126	1,946	2,553	3,285	2,464
Coal, tons ¹	295	263	380	497	107
Maize, cwts. ¹	19	24	516	927	27
Meat, lbs. ¹	1,609	5,499	18,468	55,314	5,069
Sugar, lbs. ¹	5,042	8,034	5,900	87,146 ²	57,256
Wine, gals.....	127	159	143	164	64
Wood — unmanf.					
cu. ft.....	2,397	5,299	5,674	6,727	4,854

* Statistical Abstract, Colonial Possessions, Vol. 1890-1904.

¹ Cape of Good Hope only.² Pounds.³ 1906.

It must not be forgotten, moreover, that a rapidly expanding population would place demands upon a rather feeble pastoral and agricultural community which could only be met gradually. Lastly it was not until after the turn of the century that the country was provided with a railway net which linked producing and consuming areas. The lines built in the nineties were intended to give access to the seaports. In the meantime, England and Australia were economically nearer the Transvaal than were the other colonies.¹

With all of these qualifications, it remains clear that in the case of five out of eight leading exports, the trend was downward to the end of the century. It would be dangerous to conclude, without a careful examination of the figures for production, that all of the industries met difficulties because

1. D. M. Goodfellow, *op cit.*, p. 137.

of their competition with gold production. But there can be no error in the case of such products as wool, skins, hides and diamonds, whose market was almost entirely foreign and whose exports all declined to 1899. It can hardly be doubted that the reason lay in the development of the gold industry, the rise of wages and prices the course of which has been traced, and the loss of a comparative advantage in these fields. As for hair and feathers, it must be noted that the former's advance was not great and was mostly lost between 1900 and 1905, while the internal conditions in the ostrich feather industry were those of rapid technical improvement as well as of an awakening foreign demand for a luxury product of which South Africa possessed a virtual monopoly.

Turning to the years following the war, it will be seen that some radical change had occurred by 1909. With only one unimportant exception (preserved or salted fish), 1909 exports were larger than for any other year by very large amounts. This is true as a trend after 1905 and bears out the conviction that her shift to an old debtor position produced the expected stimulus to South Africa's exports and served to reduce her advantage from trade.

The imports also tell a remarkable story. Bearing in mind all of the cautions mentioned above, it remains impossible to account for the large expansion which occurred up to 1899 in the case of nearly every commodity listed except by reference to the capital imports and the production of gold. The goods chosen were selected because each was an important product of South African industry and one with which it might be supposed she could supply her own needs. Butter and cheese, meat and candles, all natural products for a pastoral country; coal, supplied in large quantities in the Transvaal; sugar, an important product of Natal — each one increases sharply to 1899. The imports of wine and timber were due to special causes more potent than the economic changes with which we are concerned. The extensive vineyards of the Cape were attacked, in the nineties, by the phylloxera, which ruined the industry and necessitated wine

imports.² As for lumber, the country is not well timbered and such forests as exist occur in small patches in rather inaccessible areas.³

After 1905, the new alignment of economic forces began to affect the imports as it did the exports. Tho the imports of 1905 were in most cases above the levels of 1899, the total for every commodity was lower in 1909 than five years before and in nearly every case below the level of 1899. Rising world prices were reducing the handicaps under which South African producers labored as compared to those of other nations. The comparative disadvantage suffered by her producers as the gold mines developed was beginning to disappear as world prices reacted to the steadily increasing flood of the precious metal.

Some attention may now be given to the statistics of production in South Africa in order more completely to discover the retarding effect of gold upon other industries. The output of some of the more important commodities is presented below. Where possible the same years were chosen as for the export and import data to render comparison easier.

PRODUCTION OF SELECTED COMMODITIES
IN THE CAPE OF GOOD HOPE FOR CERTAIN YEARS*
(Cape proper, excluding Bechuanaland and the Native Territories)

All figures in thousands

Commodity	1891	1895	1899	1904	1909
Wheat, bu.	2,654 ¹	2,413	2,133	1,607 ¹	2,345
Mealies, bu.	1,629	1,348	896	1,274	1,429
Wool, lbs.	51,407	40,792	29,676	32,954	.....
Mohair, lbs.	6,638	7,233	6,389	8,556	.....
Feathers, lbs.	144	276	278	389	.....
Cheese, lbs.	37	22	26 ²	8	205
Goats, no.	5,973	4,314	4,805	5,482	6,580
Sheep, ³ no.	16,706	15,646	12,640 ³	11,819	18,807

* Statistical Register, annual vols., 1891-1909.

¹ Census 1891, 1904.

² 1898.

³ Entire Cape.

It will be seen that, at least for the Cape of Good Hope,

2. *Ibid.*, p. 110.

3. de Kock, *op. cit.*, pp. 268-274.

the output of agricultural and other commodities tended to decline in almost every category up to 1899, the only exception being feathers. On the whole the figures show a rise in 1904 and this increase became marked in 1909 in the few cases for which comparable data could be obtained. It might have been expected that the gold industry, providing a larger home market for agricultural and pastoral products, would have stimulated local production, even tho foreign markets were lost; but this is not borne out by the figures given. The reason may, of course, be found in the lack of transportation facilities rather than the superior competition of foreign sources of supply.

If any part of the country had experienced such a stimulus, we should look to find it in the Transvaal, considerable areas of which are arable. Here the facts are quite clear.⁴ A land boom occurred, prospecting companies buying up land throughout the territory. This flood of wealth made it unnecessary for farmers to struggle for ordinary farm income, while the demand for their oxen to transport supplies to Johannesburg led many of them to let their farms decline in productivity while they exploited this new demand for their labors. Finally, the land companies held great areas of land out of cultivation for years while mineral prospects were being determined. On the whole, it may be said that the Transvaal responded hardly at all to the new demand.

In smaller degree, this was true throughout the country. As time passed, it became less true, for the readjustment of world prices as well as the development of transportation did much to stimulate agriculture. But even in 1921, Samuel Evans, chairman of Crown Mines Ltd., made the following statement, "I have been told and I believe it to be the case, that land is cheaper in South Africa than land of similar quality with equal railway and export facilities in Canada, Australia and the western states of America. Why? I suspect that the right answer is that owing to the high cost of production and transportation here due to the higher cost of living for Europeans, the real earnings of South African

4. D. M. Goodfellow, *op. cit.*, pp. 132-134.

farmers are less per acre or per morgen than those of farmers in the countries mentioned."⁵

Even in greater degree than agriculture, manufacturing was held back by high wages and costs during the nineties in the face of established and effective industries in other countries. The long haul to South Africa gave the local producer some advantage, even tho tariffs offered only moderate protection. Along with this at least in the Cape, the half-caste working population was efficient, abundant and cheap.⁶ For several industries, local supplies of raw materials such as wool, coal, hair and foodstuffs were ready at hand. Yet no more than a handful of so-called manufacturing concerns existed before the Boer War and the term household industry applied to most of the country. In the Transvaal, skilled labor was absorbed at once by the mines. Tho lead mining, lumbering and cement making could well have been developed, little was done until the government began to grant concessions to certain groups of individuals, and even then great industries such as iron or engineering did not appear.⁷

Because of the earlier opening of markets, developments at the Cape were more widespread, tho even here there was hardly more than small handicraft or home work. Fruit canning, wagon making, tanning, building, milling, baking, tailoring, printing, tool-making and others appear in the 1891 census enumeration of establishments. In all, they numbered 2,230, of which only 327 used steam or gas engines totalling 6,917 horsepower. Employees numbered 32,735 or less than 15 per establishment, while the total value of plant and machinery amounted to £1,956,461.⁸ In 1904, according to the census of that year, 52,730 persons were employed in Cape factories and the number of establishments was 2,617. These concerns possessed 615 engines which had a combined horsepower of 31,587, indicating the post-war expansion

5. Samuel Evans, Annual Meeting of Crown Mines Ltd., May 26, 1921, p. 15.

6. D. M. Goodfellow, *op. cit.*, pp. 178-179.

7. *Ibid.*, pp. 168-171.

8. Statistical Register, *op. cit.*, vol. 1891.

which had taken place.⁹ A still greater expansion appeared in the other colonies and especially in the Transvaal. But taking the whole period, the growth was painfully slow up to 1911; the gross value of manufactures reported in the census of that year was only £17,248,834 or less than the £19,530,487 of 1904.¹

Many obvious reasons can be assigned for this repression of manufacturing. Viscount Bryce, commenting upon the South African possibilities, pointed out that the country lacked the three prerequisites of successful manufacturing, namely, a large market, cheap power and cheap and efficient labor. Population was relatively small, few rivers existed to provide water power, and coal, tho abundant, was of poor quality. While native wages were low, 10s to 20s per month, the workers were inefficient, changeable and unstable. The wages of white workers were double those of England and above the level of the United States.²

But many of the immediate hindrances to manufacturing were created by the mining industry, which attracted labor from other pursuits with high wages, absorbed most of the country's capital and so increased the prices of all commodities as well as the rate of profits as to place manufacturing as well as agriculture at a disadvantage in competition with other nations even in the home market.

Here, then, is an economic episode which in many respects is unique. A country far removed from the more travelled paths of economic life, undeveloped, pastoral and agricultural; a great industry erected in a short time in an inaccessible, barren and almost uncivilized region; an industry whose semi-manufactural product, gold, was, for lack of mint or refinery, shipped abroad for its finishing touches just as any other raw material might be exported; large imports of capital, necessitated by the nature of the gold industry, the need for

9. D. M. Goodfellow, *op. cit.*, p. 190.

1. de Kock, *op. cit.*, p. 288.

2. James (Viscount) Bryce, *Impressions of South Africa*, 1899, p. 297 *et seq.*

transportation facilities and the growth of new communities; a native population low in intelligence but capable of excluding the white man from tasks requiring brawn; a tangle of economic forces, rising world prices, newly discovered economies in production, constant demands for fresh capital, an increasing burden of debt service. Yet, in spite of all these peculiarities, the old-fashioned principles seem to apply. Price movements, trade changes, wages, comparative advantages, all followed the pattern which has become a staple of economic reasoning in the field of international trade.

DONALD WOOD GILBERT.

UNIVERSITY OF ROCHESTER.

THE UNITY OF VEBLEN'S THEORETICAL SYSTEM

SUMMARY

I. Introductory; neglect of Veblen's general theory, 598.—II. His main criticisms of economics, and the fundamental standpoint implied therein, 600.—III. Psychological postulates of Veblen's theory; the evolutionary idea, 602.—IV. Summary of the theory: the savage era, 605; the barbarian era, 607; the period of handicraft, 611; the age of the machine process, 613.—V. Analysis of the modern economy, 614; its place in the general theory, 617.—VI. Integration of Veblen's ideas, 618; this a system of theory different from the Marshallian, 620.—VII. Criticism of Veblenian psychology, 622; treatment of history, 623; and institutions, 624.—Conclusion; issue of the institutional controversy, 624.

I

No small part of the recent discussion in economics in this country centers in the controversy between the "institutional" and the "orthodox" schools of theory. The debate in this connection has gone on almost incessantly, and sometimes at a high heat, for some thirty years, and it has attracted so much interest that the American Economic Association has found it worth while on several occasions to provide a round-table for the pursuance of the argument.

Yet it cannot be said that the issues involved in this controversy are altogether clear. In spite of the efforts of such level-headed critics as Prof. Paul Homan, the specific points of difference remain obscure. It is generally recognized, of course, that the broad question is one of the method and scope of economic analysis, and that the choice to be made is between following in the tradition of Alfred Marshall and taking the standpoint of Thorstein Veblen. But so broad a statement clarifies things but little. For, altho the Marshallian type of theory has been amply expounded, defended and elaborated, so that every economist can know what it stands for, the Veblenian type of theory remains something of a mystery. It is no compliment to the institutional economists that as a rule they have not taken the trouble to attempt a consistent statement of the doctrines of Veblen, nor even to

set forth clearly the points upon which they agree with him.

The result is that Veblen's position has never yet been judged in true perspective, nor his ideas interpreted in proper sequence or adequate integration.¹ It is known well enough that he was a severe critic of the so-called "orthodox" economics; it is known, also, that he was a satirist of present-day society; in some quarters it is acknowledged that he was the prophet — if not the founder — of the institutional school; and frequently it is noticed that he had some unique ideas concerning the workings of the economic mechanism. But it seems to have escaped serious attention that all of these four views are but glimpses of a broader thing, and that Veblen attempted to forge an integrated system of economic theory along entirely original lines — and here is the essential thing.

The primary object of the present essay is to clear away some of the misunderstanding which obscures Veblen's true position. Some effort of this kind is justified by the tradition that Veblen's is the one and only example we have of a comprehensive system of economic doctrines constructed along institutional lines — a tradition vaguely held but widely held. The principal thesis to be developed in this paper is that, contrary to general opinion, the man does offer such an integrated system.

This thesis will be developed in four stages.² First, it will be demonstrated that the fundamental standpoint of Veblen's theory underlies and provides the basis for his criticism of previously existing theories.³ Second, it will be shown that the psychological doctrines which he adopts are significantly in accord with the same underlying point of view. The next step will be to outline in summary fashion the framework of Veblen's theory itself. The fourth stage will be to show the organic connection between his general theory and his analysis of the modern economy.

1. Homan attempts something in this direction in his well-known *Contemporary Economic Thought*, but his effort is not entirely successful because he fails to notice the cause and effect sequences which bind together the several parts of Veblen's structure. See §VI, below.

II

One great objective guides Veblen through all the detail of his criticism of existing types of economic theory, and that is to impress the idea that economics is a "taxonomic" science.² This phrase, in itself, should not be interpreted as ridicule, nor even as straightforward criticism, because it is intended merely as a terse description. The point is that it describes something which, in Veblen's view, does not satisfy the requirements of modern science. Economics, in his opinion, has followed rather blindly in a tradition which is now obsolete, so that its organon, in spite of undeniable merits, needs rebuilding along entirely new lines. Veblen's order of argument in this connection, then, is to analyze the tradition in which economics has followed, or to show why the science is taxonomic, and then to show why a taxonomic science is unsatisfactory.

According to Veblen's analysis of the development of economic thought, the theory of today is substantially an elaboration of the English classical doctrine. He recognizes variations and differences, of course, as represented in such contrasting works as those of Marshall and Clark and the Austrian school. But in essence — and this is the significant thing — he finds a general consistency of outlook and method. The set of "preconceptions" in the light of which the theory is drawn up is inherited from Adam Smith and the English Utilitarians, and despite certain shifts in emphasis and changes in connotation, it remains fundamentally unaltered. The metaphysical basis of present-day theory has come down from the classical masters.

Specifically, the metaphysical basis of economics is represented as including two well-marked elements: first, a natural laws philosophy; second, a hedonistic psychology. In regard to the former, the argument is not altogether lucid. Here, as almost everywhere in Veblen's writings, the complexities of

2. I do not venture here to discuss Veblen's critical work any more fully than is necessary to my main argument. Any reader so minded may consult Veblen's *Place of Science in Modern Civilization*, a volume in which all the material relevant to this part of his economics is collected.

his strange method of argument, his peculiar prejudices, and his queer vocabulary make interpretation very difficult, so that the accuracy of a compressed statement is somewhat uncertain. The general idea seems to be, however, that the "natural order" of Adam Smith has been reëmbodied with relatively unimportant alteration in the "normal order" of Alfred Marshall. It is true that the feature of moral approval has been expurgated and the guidance of the divine "invisible hand" dispensed with, but the statical character and the unreality of the conception, in Veblen's opinion, persist. The result is that economic theory "remains an inquiry directed to the determination of the conditions of an equilibrium of activities and a quiescent normal situation."³

As regards the hedonism which is supposed to be implicit in orthodox economics, Veblen's ideas are more directly stated. He asserts, for example, that a psychology of this kind ignores the influences of such forces as habit and convention, and that it can account for conduct only in so far as it is thoroly rational and intelligent conduct. Furthermore, he contends that, in spite of the fact that the living man is a dynamic mover, hedonism represents man as a passive creature who reacts only to external stimuli in a mechanical sort of way. To quote, ". . . the hedonistic man is not a prime mover. He is not the seat of a process of living except in the sense that he is subject to a series of permutations forced upon him by circumstances external and alien to him."⁴ It is largely as a result of adopting this sort of psychology, Veblen goes on to say, that economics has failed. For a theory based upon an assumption of this kind can do no more than enumerate conditions of equilibrium.

Both these elements in the philosophy which underlies economics lead, therefore, to the construction of a science of static relationships. The logical order of Veblen's criticisms of orthodox economics is thus made plain. He states as a major assertion that economics is a taxonomic science, and advances as reasons for the situation that the science is under

3. Op. cit., p. 173.

4. Op. cit., p. 74.

the spell of a natural laws philosophy and a hedonistic psychology. This leaves him in a position to direct his attention to taxonomy as such, not with particular reference to economics, but as a general type of science. Also, it leaves the implication that any sound reconstruction of economics must start from new postulates.

It is Veblen's opinion that modern science demands an evolutionary approach. Any analysis which strives for an explanation of phenomena along taxonomic lines does not satisfy the canons of what a post-Darwinian would call a science. The modern investigator, he asserts, demands an explanation of things in terms of cause and effect, and postulates that the causal relationship has neither starting-point nor stopping-point but runs in an endless sequence. Precisely here is where economics, then, falls down. Its analysis is of a balanced equilibrium instead of a continual movement. Its laws are static, not dynamic.

This is the fundamental standpoint from which Veblen works, the standpoint of an evolutionary science. It provides the ultimate ground of his objections to current economic theory, since it is with this in mind that he tries to impress that economic theory is taxonomic, and since it is on this basis that he holds taxonomy to be outworn. He offers no proof whatever for the validity of this notion, stating it in his bland way as tho it were incontrovertible. Yet it is upon a foundation thus insecure that Veblen tries to build a new system of economic theory.

III

Since Veblen believes economics to have been driven to taxonomy largely because of incorrect ideas about human nature, he himself adopts what he considers to be a modern scientific psychology. Wishing to get away from the hedonistic calculus and to derive the benefit of the most recent and most reliable studies of the springs of human action, he takes over, broadly, the psychology of William James and William McDougall.⁵ According to outstanding investigators, he says,

5. Cf. Paul Homan, *Contemporary Economic Thought*, p. 128, and Z. C. Dickinson, *Economic Motives*, p. 277.

the human being is spiritually a bundle of instincts. And an instinct, he goes on to say, is something that sets a goal for activity, or, from another point of view, something that demands satisfaction. It is a purposive thing, a thing of teleological content. The result is that the living man is similarly purposive. Always and everywhere man, driven by the instincts, seeks to do things. The emphasis is thus put on the side that man is an active agent.

Now Veblen is curiously brief in his enumeration of instincts; only three of them are named. His idea is that economic theory need consider only the ones which are peculiarly intimate with economic activity. He presents, therefore, the following: the "instinct of workmanship," the "parental bent," and the "bent of idle curiosity." The instinct of workmanship is defined as a proclivity for doing things efficiently which is of service in the achievement of whatever ends the other instincts might appoint. The parental bent is defined so as to include all sentiments of an unselfish sort, relating not just to the family but to the whole social group. It might better be called the instinct of social sympathy. The bent of idle curiosity is simply a desire for knowledge. It has no utilitarian aims in itself, but it does contribute to them indirectly through the knowledge accumulated at its instigation.

Behavior, however, is not governed solely or directly by the instincts. Surrounding conditions count for much. And surrounding conditions are subject to change. The ways and means of satisfying desires are the product of intelligence and experience, and they are tractable by reason of the growth of experience. Thus developments in the technology of production, for example, have occasioned great changes over the centuries in the forms of economic behavior. Again, just as important as technological factors are conditions not directly pertinent to economic activity. Changes in the institution of private property, for instance, have had their influence on the organization and the effectiveness of productive effort. Moreover conditions of quite another character are influential in behavior. To cite a case of Veblen's,

conditions of long-continued peace are most conducive to effective and free exercise of the instinct of workmanship and the parental bent, whereas persisting conditions of chronic warfare are likely to turn out otherwise.

The changes in behavior which take place due to the action of forces of this kind are, according to Veblen, very slow-moving. At any given time, or for considerable periods of time, behavior seems practically as constant as the elemental dispositions. So constant is it, indeed, that it might appear to be instinctive. In reality, however, it is not instinctive. The fact is, according to Veblen, that behavior at any given time is mostly a matter of habits and conventions which have become so firmly established that they are practically insensitive to the demands of the instincts. In that sense they are "institutional." They might be institutional also in another sense. They are apt to find a place in the written law, especially if at some previous time it has appeared necessary to the achievement or protection of instinctive ends to place them there. In such a case it frequently happens that changed conditions would demand the removal of these elements from the law. The net result is that, whether embodied in the formal law or merely in popular convention, the elements which most strongly influence the pattern of behavior at any given time are institutional in character.

Now what does that mean? It means that for periods of considerable duration — indeed for centuries — the character of economic activity is not determined directly by innate human instincts, but is rather a matter of "institutions."⁶ Hence the explanation of economic life is not to be found in the quality of human needs and aspirations, but is to be found only in the nature of the "institutions." For the purposes of a so-called "cross-section" analysis, the investigation of existing institutions is all that is necessary; but for a thoroly complete, scientific economic theory, only a study

6. Neither Veblen nor any other economist so far as I can discover has offered yet a satisfactory definition of the term "institution." I regret, therefore, to be forced to use the term. But I trust that the context will indicate fairly intelligibly at least the idea involved.

of the evolution of institutions, including an analysis of all the factors which have governed the course of that evolution, will suffice. This is the conceptual foundation of Veblen's institutional economics.⁷

IV

Veblen's economic theory, then, is a theory of the evolution of economic institutions. The basic notions in it are three in number. They are: first, that behavior is governed fundamentally by unchanging instincts which give rise to action of a dynamic sort; second, that behavior is guided more proximately by institutions; third, that institutions as viewed over the course of human history have been in a state of slow but continual change. The institutional theory is largely an elaboration of these three fundamental ideas and may best be elucidated by keeping the emphasis on them.⁸

One further analytical device must be commented on, however, before an exposition of the theory is attempted. Veblen finds it convenient to divide human history into four stages, or eras, and to treat of each in turn. The "savage era" includes a span of some thousands of years beginning at some undefined date and ending in the early half of the neolithic period. It is a stage of history concerning which our knowledge is only archeological. Next, the "barbarian era" embraces the ensuing centuries to about the end of the middle ages. Of this period we have a more substantial history. The third stage, the "era of handicraft," extends from the middle ages to about the beginning of the eighteenth century in England, to a later date on the continent, and to the first of the nineteenth century in America. Last is the contemporary "era of the machine process." These several periods are admitted to be not sharply separated; they are supposed to

7. I am indebted to Mr. Aaron Goldstein for suggestions which have helped me a great deal in the argument of this section.

8. The material for the present section of the paper is drawn largely from Veblen's *Instinct of Workmanship*, the only one of his books which may be considered in any sense a general treatise on economics. It is in this that he develops most systematically his theory of economic evolution, and it is in the light of this that most of his other writings must be interpreted.

be marked off only roughly, according to certain characteristic features. The chronology, also, is intended to apply only to that part of the world which is inhabited by the races of Western Europe and in which the Western civilization has grown up. It is the evolution of the economic phases of this culture with which the theory is concerned.

Veblen represents as the characteristic feature of the savage era the predominance of peace. According to his description, which is rendered plausible by citation of anthropological findings, the people were settled in small communities, and derived their livelihood from an agricultural activity. Both land and instruments of production were held in common; there was no institution of private property.

Under these conditions the people of Northwestern Europe achieved a remarkable progress. They entered the era with only the most meager stock of knowledge and the crudest of economic technique, but emerged at its end with an imposing body of technology applied with marked success. They had learned a good deal about the growing of crops and the breeding of animals; they had devised rude tools of bronze and iron; they had done something even in decorative art.

Now what were the causes of this great progress? Veblen believes that the causes were partly psychological and partly environmental. He argues that the parental bent must have been strong in the make-up of the people to generate so harmonious a group life, that idle curiosity must also have been strong to bring such a growth of knowledge. But he accords the main credit to the instinct of workmanship. So powerful was the drive of this instinct that it impelled the people in each community to turn into effective use not only the matter-of-fact knowledge they themselves discovered, but technical methods acquired from outside as well.

Never could the instincts have had such free play had not the environment been propitious to their exercise. The peacefulness of the times was of salient importance. Peace permitted the formation of habits well adapted to a settled industrious life; peace fostered, too, the growth of a mild religion and a steady accumulation of useful knowledge.

Most important of all was the fact that the prevalence of peace allowed the continuance of a communal organization of property and an unimpeded diffusion of technological information. In short, both the nature of the people and the set of institutions under which they lived were conducive to advance.

Following upon the centuries of peace of the savage era came a period characterized by war. So prevalent was war in this later age, indeed, that it gave rise to a general attitude of belligerence. And so significant was this pugnacious frame of mind, in turn, that the barbarian developments could never have taken place without it.

The most important single development and the source of most of the minor developments of the barbarian era was the founding of the institution of private property. Whence came private property? In part, according to Veblen's argument, this institution had its origins in the savage era, because it depended upon the progress achieved in that earlier period. Only by means of the technological advances of the earlier age were people enabled to distinguish between various plots of land in point of fertility; only through the growth of useful knowledge did it become possible for them to devise instruments of production. Only after such progress had been achieved, therefore, could specific objects for ownership be identified. But once that position had been reached, whoever could establish control over superior land or over material instruments would have a source of high income. Thus the most elementary conditions for the institution of property, namely, something to own and some point in owning it, were satisfied by the developments of the savage era.

While Veblen does not state with finality the precise details of the process by which the institution of ownership took form, his general interpretation is clear. He is positive in repudiating the view that it grew out of the storing up by individuals of surplus product, and he is emphatic in pointing to predatory exploitation as the root from which it did grow. Two possible lines of development are suggested. One is that religious bodies or their officials, by reason of their power

in the primitive communities, might have been able to get a prior claim to the fruits of productive effort or even a claim over certain pieces of good land. This would tend to concentrate wealth in their hands. The other explanation — more seriously treated as well as more plausible — is that ownership arose directly from military operations. Under the barbarian conditions of mutual animosity between communities, any accumulation of wealth in one community operated as an inducement to aggression by others. Aggression means organization for war; organization means concentration of authority. It would then appear perfectly natural for a large proportion of booty to gather in the hands of the war-chief. It would be perfectly natural, also, in view of the continual recurrence of strife, for the war-chief to retain his superior rank and wealth, not simply in the seasons of war, but also in the occasional intervals of peace. The result would be that wealth would accumulate permanently to the portion of military leaders.

The rise of ownership was accompanied by two associated developments which, tho subsidiary, deserve separate notice. One was that power went with the ownership of wealth, power, that is, over the disposal of the property. In other words, the position of leaders was such that not only could they control the military operations of the community, but also, because they owned the means of production, they could control its economic activity. Ownership of the means of production and control over industry thus went together. The second minor phenomenon was that a superior position in public esteem went along with ownership. Those whose wealth was large were accorded unusual respect, since possession of wealth signified rank and power.

The matter may be put in another way. Simultaneously with the unequal division of wealth due to the rise of private property, there grew up a habit of drawing distinctions of superiority and inferiority. In the savage state such a thing had been unknown, but in the barbarian state the new conditions gave rise to this sort of discrimination in marked degree. It was a new concept that arose, the concept of

status. Having stated this, Veblen presses the point further. He argues that the connection between property and status was a necessary one; property could arise only in a society accustomed to a differentiation of ranks. In fine, he asserts that the concept of status and the institution of ownership were reciprocally causal phenomena, and that both were fostered by strife.

There are certain logical difficulties in this view. It seems paradoxical that a people steeped both by nature and by experience in the habits of peace should suddenly and unaccountably become warlike. It seems still more paradoxical that a people instinctively unselfish and habitually sensitive to the common good should so change in character as actually to regard material gain a sufficient reason for war. Neither of these paradoxes does Veblen resolve. Moreover, there are obvious logical contradictions about accounting for property as brought on by predation, when it is also argued that predation is provoked by property. And it does not help much to try to escape by appealing to "status," if that itself is in turn due to both property and war. In short, Veblen's position here is rather insecure.

It is not to be wondered at, Veblen continues, that the conditions of the barbarian age led to a submersion of the parental bent. The association of wealth with military prowess, the union of economic control with ownership, the social prestige of the wealthy — all these resulted inevitably in stimulating active self-interest. No longer did people feel keenly responsible for the welfare of the community, nor did they exert their talents for the benefit of the group. There was prestige to be gained; and the way to get prestige was to get wealth. The result was that, as a matter of course, the field of social sympathy was usurped by "self-regarding impulses."

It might be expected, however, that self-interest would not run counter to the common good. Usually one takes for granted that in the quest for wealth people must produce. Not so Veblen. He finds that in the barbarian era the arousing of self-interest did indeed lead to an added diligence in

acquisition. But the acquisition was mostly by predatory methods and never penetrated the zone of productive activity. Hence self-interest gave no stimulus to technological progress.

Nor did other factors. The preoccupation with affairs of a military nature was at the expense of neglecting domestic economy. The repute attaching to the wealthy and the ease of getting wealth by predation discouraged genuine productive effort. Moreover, that disrepute which was attached to those who because poor had to be diligent — a corollary of the prestige of the rich — that indignity was hardly calculated to encourage productive efficiency. Technology languished.

The arts and tastes of consumption, on the other hand, underwent great change. As suggested above, the possession of property, at first thought of as merely an accompaniment of social importance, came to be deemed important in itself. So that, whereas at the start wealth was desired only secondarily, as one of the marks of prestige, later it was desired because by itself it conferred prestige. Correspondingly the objective ends of self-interest gradually converged upon the accumulation of property. Correspondingly, also, a new emphasis was placed on whatever indicated wealth. Hence all the phenomena of "conspicuous consumption."⁹ Abstention from productive work, ostentatious waste and splendid display in all their manifold forms became objects of reputability because they indicated wealth. On the other hand, diligence, economy and frugality, being indications of poverty, became disreputable. Finally, because the position of the laborer under these conditions was one of no little indignity, labor became irksome.

By such a train of argument does Veblen attempt to avoid

9. Veblen's real argument in this connection is often misunderstood. He reasons that at first "conspicuous consumption," altho admittedly wasteful, was a thing of merit precisely because of its wastefulness. In the course of time, however, the various manifestations of waste came to be thought of as not wasteful but beautiful, worth-while, and economical. Consequently, he concludes, people today, because they try to conform with conventional standards of decency, are actually wasteful even when they think themselves economical. It is this line of reasoning which forms the core of the Theory of the Leisure Class.

an appearance of contradiction. Seeing that in the world of today the quest for material gain is well-nigh universal and the aversion to work about equally pervasive, but believing that these things are not instinctive, he argues that the instincts have been submerged. Innate dispositions — so the argument runs — have always been present; but during the barbarian era they became either inoperative or perverted by reason of adverse conditions. Furthermore, the institutions developed in the course of that period formed a sort of layer over the instincts, so tough a layer that the instincts have not even yet penetrated through to behavior.

The substance of the changes which are attributed to the barbarian era can be recapitulated in a very few words. First, the institution of ownership was established, ownership carrying with it economic control. Second, there were aroused motives of self-interest which manifested themselves almost exclusively in acquisitive pursuits. Third, the emphasis on status, which came to be practically identified with wealth, led to standards of consumption of an extremely wasteful nature. Fourth, the disrepute which was attached to those who, because poor, had to do productive labor served to make labor irksome. Finally, all of these factors, together with various less influential ones, caused a degeneration of technology.

A new stage was entered on toward the end of the middle ages. Northwestern Europe then passed into a relatively peaceable mode of life. The way was open for a revival of technology, especially in those regions where barbarism had not brought complete collapse. Thus opened the era of handicraft.

During this period the organization of production did not maintain any single shape. It took first the form of a guild system and a local trade. But this did not survive for long. There was, on the one hand, such a great development of industrial technique that production demanded an ever larger and more costly mechanical equipment; and, on the other hand, there were improvements in transport and communication which constantly extended markets. Correspond-

ingly the scale of operations grew, so that the small shop and the petty trade gradually gave place to the factory and world commerce.

In this general development, Veblen finds several important changes. For instance, he notes that there was an extension of the institution of ownership. The multiplication of apparatus, not simply in the form of tools and machines, but also in the form of ships, warehouses, and the like, made it inevitable that the control of industry should come to rest in the hands of the only people who could provide the necessary capital, namely the wealthy classes. Consequently private property was extended to cover investment for profit. Here Veblen finds the origin of the wage system. Altho legally the craftsman was perfectly free throughout this period to dispose of his product or his labor as he pleased, yet toward the close of the period actually he was not free. Requirements of capital made it impossible for him to dispose of either his product or his services except to capitalist employers. The craftsman became a wage earner.

These changes, however, were but phases of a more fundamental development. Gradually a broad division of social classes was taking shape. On the one side, a group of owners, investors — "capitalists" — emerged from the wealthy classes; on the other side, a mass of manual workers — "labor" — was recruited from the great body of the poor. This class division was more than a simple one of wealth. It was a separation of interests and habits as well. The capitalist class were interested in ownership and profits; their work was a "gainful manipulation of property"; their logic was a logic of "worldly wisdom." The laboring class were concerned with manual production; their interest was in mechanical efficiency; and their thinking a matter of technological insight.

In spite of this broad and deep separation of classes, the conditions of the handicraft period were favorable to advance. During the entire period, the workman occupied a central position. He obviously was the one who shaped material goods. No less obviously, he was the agent whose efficiency governed the success of investment. Moreover, in a situation

of rapidly expanding markets, the material output of industry was the principal factor limiting profits, so that it was to the benefit of the capitalists to do everything they could to stimulate productive efficiency. Thus, as a result of the peculiar circumstance of rapidly widening markets, the gain of entrepreneurs, no less than the welfare of the community at large, depended upon technological efficiency. Accordingly, the instinct of workmanship could operate unimpeded. The result was a vast improvement in technology.

It is not to be overlooked, Veblen seems to stress, that this was essentially a strange condition of affairs. A duality of interests and classes — not to say an opposition — was being nurtured. We see established, on the one side, a class of capitalistic employers who engaged in economic activity by way of investing in production and trade for profit. On the other side, under the control of the investing class, we see mobilized a preponderant part of the population whose economic activity was strictly productive labor on material output. It was a division of labor between the making of money and the making of goods, a division between "business" and "industry."

In continental Europe, says Veblen, the ravages of war eventually brought the handicraft organization to collapse. But in England, where things were comparatively peaceful, the close of the handicraft period was not a collapse but a technological revolution. The era of the machine process dawned.

The typical traits of this new age are visible at several points. From the standpoint of technology, the modern age exhibits new features. Technology and science are closely allied, and both are of a uniquely objective character. In extent, the productive apparatus of the industrial system is vast beyond previous experience. It is so huge in mass, so intricate in detail, and so closely interconnected that it constitutes a single gigantic mechanism. Secondly, the rôle of the workman has changed. No longer does he control the apparatus, he merely tends it in the rôle of an assistant. Rather than a user of machines, he is used by them.

The machine process has already begun to dominate various other aspects of modern life. Its requirements of uniformity and standardization have had the effect of ordering our habits of work and amusement into a sort of mechanical routine. It imposes upon us a schedule of hours based largely upon its convenience; it requires of us a pattern of consumption adapted to its potentialities. Even our mode of thinking is influenced by the machine process, for our logic is materialistic in character largely because of our contact with mechanical operations.

So far, however, machine industry has not exercised any effective force over general institutional growth. Industry today is supervised and controlled on the canons and laws developed in the handicraft period. The owners who are in charge of industry still think in pecuniary terms. They know nothing of technology, they think only of markets. And their objective is money profits. But the interest of society is in material output, and the social well-being depends upon an efficient and smooth-running industry. But business controls industry with a view to profits. And profits can best be gained by disturbance of industry.

The modern economic situation as depicted by Veblen, then, is a conflict of business and industry.

V

Using now as a background the preceding brief statement of Veblen's general theory, we may turn our attention to his analysis of the modern economy in order to see at what points it is connected with the general scheme. For this purpose it is not necessary to go into the details; it is sufficient to review the outlines.¹

The modern setting is tersely portrayed in the opening paragraph of the *Theory of Business Enterprise*: "The material framework of modern civilization is the industrial system,

1. The best presentation of this part of Veblen's work is contained in his *Theory of Business Enterprise*, altho on some points his *Engineers and the Price System* is more intelligible. This latter book, it may be remarked, has turned out to be a sort of old testament of the recent cult, *Technocracy*.

and the directing force which animates this framework is business enterprise."

Veblen elaborates. The whole of modern industry is a machine. Whether in manufacturing or in the extractive and agricultural spheres, operations are conducted according to a reasoned and systematic procedure which is the essence of the machine process. Every branch, also, makes use of the mechanical technique of fine measurement, accurate calculation, and rigid standardization. Moreover, no single part of the whole range of industrial processes is self-sufficient. Each part depends for its efficient working upon a steady and accurately gauged flow of raw materials from other parts of the system as well as upon an equally well regulated vent for its output in still different parts. The interdependence, the integration is complete. This unique organization of industry has led to great economy. It has permitted an automaticity, a speed and a productivity beyond all precedent. But to be efficient in the fullest degree the system must not be disturbed, for friction at any point is likely to cause general derangement.

Now the connections between the parts of industry, the "interstitial adjustments" as Veblen calls them, are price connections. Affairs of price are the concern of business men, not technicians, so that order in the industrial structure really depends upon the business men.

The purpose of industry is to produce goods for the subsistence and comfort of men. The purpose of business, on the other hand, is to make money profits. So long as markets are expanding, as was the case in the handicraft period, this duality of purpose need cause no harm; but in the modern industrial age markets do not expand at a sufficiently rapid rate. The result is that the duality becomes a conflict. The making of money profits in the ordinary run of cases demands that business men "upset or block the industrial process at some one or more points."² Here is the crux of Veblen's analysis.

2. *Theory of Business Enterprise*, p. 32. As stated above, it is not proposed to go into detail here. Consequently all of Veblen's interesting

Analyzed more closely, this is revealed as a conflict of institutions. Business is an outgrowth from, or the modern embodiment of the institution of private property. For under modern conditions the institution has taken a new complexion. Whereas originally ownership was related to such tangible things as land and tools, and under the handicraft era was extended only in the sense that it covered a greater volume of material equipment, in modern days it has been extended so as to embrace capital of quite another sort. For today investment does not mean the purchase of actual equipment as formerly, it means purchase of securities. And under the up-to-date methods of finance the securities whose ownership conveys control are those which represent no visible property but only the earning capacity of a concern as such. Typically these shares are held by investors who have no connection with the producing unit itself — absentee owners. These people are not interested in production, but in capital gains. The upshot of the whole thing is that our modern institution of ownership vests the control of industry in the hands of absentee owners of intangible assets who direct things with a view to capital gains.

Industry, on the other hand, is the material embodiment of technology. The technological knowledge which forms the basis of the new order of industry is a joint possession of the community at large. It is held, transmitted, used, and increased by the whole population. The object of this technology is to increase the material wealth of society.

But owing to the circumstance of inflexible markets, the effect of modern ownership is to deliver the benefits of increased productive power into the hands of the relatively small group of the capitalist class, to the continual detriment of the "underlying population." Changed conditions have outmoded the system of property. And inevitably the institution of ownership will perish.

A readjustment is the more likely to come because of a discussion of advertising, capital, finance, combination, cycles, and the like is ignored. In reality these various topics are but particular aspects of business activity, particular kinds of disturbance.

divergence in the habits of thought of the masses and those of the owning classes. Under the influence of machine industry, the masses think more and more in materialistic terms. Their reasoning involves the notion of cause and effect relationship. It is impersonal, objective, non-moral. On the other hand, the owning class, who have never come into sustained contact with the machine process, think in purely pecuniary terms. They deal with values, profit and loss, monetary units — personal, non-material things. Their reasoning is of rights and duties. This line of cleavage is so deep-seated that the two groups do not understand each other. The masses cannot understand the institution of ownership nor the line of argument by which property rights are upheld; the owners of property cannot comprehend the workings of the machine process nor the line of reasoning by which it is explained.

The net result is that only one of the two institutions can survive, either ownership or technology. The chances, Veblen thinks, are in favor of technology, because it accords best with the native instincts of the race. But the odds are against ownership. For business cannot get along with industry, neither can it get along without it.

Now this portion of Veblen's work is but a continuation of his general evolutionary theory. There are several substantial reasons for regarding it so. First, the point of view is that of an evolutionary theory. Having indicated the origins of the institutional framework of modern society, Veblen here attempts to examine the economic operations conducted in that framework with the object of discovering how well the institutions fulfill their purpose, how successfully they combine. Discovering — so he thinks — that they are in conflict, he turns to forecast the future course of change. It is the evolutionary point of view. Again, the institutions dealt with here are precisely the same ones as those analyzed in the general theory. In spite of the fact that the terminology shifts from "ownership" and "technology" to "business" and "industry," it soon becomes apparent that the two sets of names are interchangeable. The only difference is a slight one of particular elements; the general content inter-

grated under the two terms is the same. Moreover, in this part of Veblen's work as in the other parts there is the same tendency to try to establish the relation between instincts, modes of thinking, and institutional conditions. For example, he takes considerable care to develop an intimate connection between the institution of ownership and the outlook and habits of business men, and a similarly close connection between machine technique and the mentality of industrial workers. Finally Veblen himself almost invariably points out the line of derivation of the factors which occupy his attention here, indicates their relation with things in his general theory; and he never dismisses a topic in his consideration of the modern economy without indicating future prospects. Clearly, this part of Veblen's work is organically joined with the rest.

VI

The thesis advanced here is, to repeat, that Veblen offers an integrated system of economic theory, and the object of the preceding sections has been to present this thesis by summarizing Veblen's views.³ But the matter may be made clearer by a more direct statement of the case. Let us consider, therefore, two questions. First, granted that the foregoing summary of Veblen's views is a fair one, what features in it justify the claim that it constitutes an integrated system? Second, can Veblen's kind of theory be regarded in any reasonable sense as an economic theory?

The first question needs but brief consideration. There can be no gainsaying the fact that Veblen's views fit together into a general theory every part of which is related to every other part. For example, the portion dealing with contemporary economic activity is intimately bound up with, is indeed but the continuation of a general theory of economic evolution. To take another example, the theory of the

3. I have not attempted in this paper, of course, to review all of Veblen's works. Some, like *The Higher Learning in America*, I have neglected because they have no very close bearing on his economics as such; others, like *The Vested Interests*, I have neglected because they in no wise add to or subtract from what he writes elsewhere.

formation of the institution of ownership is an attempt to draw lines of causal sequence between the developments of the savage era and the outcome toward which those developments tended in the barbarian era. And, to continue the illustrations, Veblen tries further to construct a causal chain which will link the barbarian development of the property institution with the emergence of self-interest, and connect that, in turn, with the expansion of commerce of the handicraft period, thus with the progress of technology in that era, and so with the industrial revolution. These are only examples; a hundred others might be cited. Not simply in general trend, but in specific detail, Veblen's work is an attempt to connect in a complicated network of cause-and-effect sequences the events of economic evolution.

It is an integrated system also in another sense. The logical elements involved are the same throughout. The instincts, the institutions of technology and ownership, environmental conditions, habits of thinking and habits of behavior are the formal elements in terms of which all the causal relations are drawn up. In the barbarian stage, environmental conditions of war plus an accumulation of wealth induced the habit of thinking in terms of status and stimulated motives of self-interest. These resulted in an acquisitive type of behavior, which, in turn, so hindered the normal operation of the instincts that the institution of ownership took form and technological development was impeded. In the machine age the same elements are concerned, altho the connections are more difficult to disentangle. Environmental conditions here include a residue of things left over as a heritage from previous ages — the separation of classes, for example — as well as such new features as the inelasticity of markets; and the institutions of technology and ownership are considerably more elaborate than before. But the relationships are of the same sort. The mechanical routine of industry is inducing a mechanistic type of thinking among the working class, while the business or owning class still reason in terms of that older logic which goes with the institution of ownership, so that the two classes

appear in opposition, particularly by reason of the inefficient way business runs industry. Moreover, the new technology of industry is so unintelligible, on this account, to the owners, that a breakdown is imminent. And the disaster will probably impinge on ownership rather than technology, because the latter has the instincts on its side. These, it must be remembered, are only illustrations of the point that, in spite of the fact of Veblen's being concerned at different times with different sets of historical fact, his causal relations always run between the parts of exactly the same set of logical elements. Not merely in terms of historical events, but also in terms of logical elements Veblen's work constitutes a connected theory.

The second of the questions formulated above has yet to be answered. Can this system of Veblen's — whether good or bad — be considered an economic theory?

Veblen's work has a much closer affinity to real economics than might appear from a cursory survey. The central topic with which it deals is after all an economic one. It is simply this — how far and by what means has society solved the problem of scarcity? Stated in another way it is — to what extent and by what methods of organization has society achieved a lightening of the burden of labor required to satisfy its needs of sustenance and comfort? It is the question which aroused both Adam Smith and Karl Marx; it is the question which inspired both Mill and Ruskin. Veblen, to be sure, employs an unusual approach; but the subject is old and familiar. To this extent his theory is economic.

There is a vast difference, however, between Veblen's conception of the economic problem and Marshall's. Veblen conceives the problem to be one of constructing that set of institutions most effective in overcoming scarcity. That is to say, he visualizes society as trying to cope with the niggardliness of nature by devising a body of technological expedients useful for the extraction of material wealth from nature's tightly-held store, and at the same time as attempting to make the most of this wealth by erecting suitable machinery for distribution and conservation. He regards also as phases

of the economic effort of society, the formation of customs, habits, and a general social atmosphere most conducive to the full expression of the innate economic instincts of the race. The Marshallian, on the other hand, conceives the economic problem to be one of making the best use of the resources already at hand within the existing framework of institutions.

In consequence of this difference in the conception of the problem, there is a difference in approach as well. Veblen's method is to examine the evolution of social institutions with a view to discovering how the present structure has been shaped. He is also interested in seeing what factors now operating are likely to change the present structure, and in what directions changes are likely to come. Furthermore, he attempts at each point to estimate the degree to which the institutional framework could solve the economic problem as he defines it. The effort of Marshall and his school, however, is directed to a close analysis of the economic processes conducted under the present social order. He is concerned only with the factors at work in the processes themselves.

Hence there is still another difference between the two types of theory, a difference in scope. Veblen's evolutionary approach demands a complete study of the whole of human history, with particular reference to the development of those habits and institutions which affect economic behavior. Marshall's plan takes these things as they are now, and aims only at unravelling the tangle of economic phenomena within the area so bounded.

The significance of these differences may be illustrated by depicting briefly the resultant divergence of attitude toward reform. Marshall's proposals toward improved economic well-being would be confined to the elimination of elements of friction and disturbance and to the adoption of a program so designed as to bring about the desired results through the workings of the existing mechanism. Veblen's means of betterment would necessarily involve a reconstruction on a grand scale of the whole framework of institutions.⁴

4. To put the contrast in another way: Marshall's reforms would aim to bring the individual economic interest into closer conformity with

VII

Most interpretations of Veblen's economics have sadly misconceived him. Neither the proponents of the "orthodox" tradition nor Veblen's followers of the "institutional" school have grasped the full significance of his work.⁵ In the folklore of economists he has been variously labelled a satirist of present-day society, a philosopher of history, a censor of the economic machine and a severe critic of orthodox theory. All these designations are correct; but they are not important. Preëminently, he is the creator of a new system of theory.

This is not to say that the system is worth very much. On the contrary it has many flaws. In fact it contains errors of exactly the sort which Veblen found — or thought he found — in the theories prevalent in his day, and it contains still graver errors of its own. It will not be amiss to indicate briefly what some of these weaknesses are.

In the first place, the psychology is not acceptable. The man who is described in Veblen's theory is a thoroly economic man. That is to say, he is a person in whom the only instincts that count for much are those bearing directly on economic activity — workmanship, social sympathy, and curiosity. At least he is supposed to be such a person at bottom, even tho after the barbarian era he appears on most occasions to be the blood-brother of the much-deplored hedonistic man — lazy, selfish, acquisitive. The explanation of how the transformation is supposed to have taken place is so far-fetched, and the action of the hedonistic impulses thereafter is so automatic, that it passes understanding why Veblen did not admit the usual economic motives from the the social good — very much as do suggestions of Pigou in the *Economics of Welfare*. But Veblen's reforms would look toward an elimination of what he regards as mere habits of self-interest, and a restoration of the purely instinctive behavior of the supposed savage era. A reflective reading of the little book on *Engineers and the Price System* will serve to illustrate. It might even be said that Veblen's criticisms of both economic theory and the social order proceed from this fundamental ground of psychology.

5. Even Homans is not an exception. He has achieved, I think, a larger view of Veblenian economics than any other writer, but he has failed to grasp its truly systematic character.

very beginning. It would have simplified and improved his work.

For this kind of theory, however, a much more complete view of human nature is essential. The theory does not deal with a cross-section of economic activity at any particular stage of social evolution; it deals with social evolution itself. And in order to explain adequately the interaction of human nature and the development of institutions it is necessary to take cognizance of the full range of psychological elements. To attempt any delimitation here of "economic motives" or "economic instincts" is to err. It is a man who is concerned, not three instincts.

In any case, it is a matter of legitimate doubt how far Veblen's kind of psychology could be considered satisfactory even in a formal view of the matter. Psychological science has changed greatly since his day. The whole apparatus of instincts, emotions, habits, and the like, has been submitted to searching criticism. What is left of it now is by no means the same as what existed then. Whether any reputable psychologist of Veblen's time would have defended his particular version of the general theory is highly questionable. Today nobody would defend it.⁶

Veblen's treatment of economic history is no better than his psychology. The most obvious fault in his history is its incompleteness. One cannot but feel that he leaves many things out of account, and that the inclusion of these things would alter the theory considerably. Particularly is this true of the presumable range of facts on the basis of which social evolution is divided into four nicely-separated stages. The objection is not merely that such a device is excessively taxonomic for use in a theory which is supposed to avoid taxonomy; the real trouble is that the facts are too frequently recalcitrant to Veblen's generalizations. He designates periods as being peaceable or warlike on very scant evidence and in spite of much to the contrary, and he throws into a consequently false contrast stages which, if separate at all, are certainly not so different as he makes them out to be.

6. I refer the reader to W. B. Pillsbury's *History of Psychology*.

Consider, for example, the supposed savage era. Our knowledge of the ancient period is admittedly vague, but we do know enough about prehistoric life to realize that it was not the quiet harmonious life that Veblen depicts. It was, on the contrary, a very hazardous and quarrelsome life. The weakness here, it must be noted, is more than an empirical one. For it is upon the assumption that this era was more than any other "natural" that the rest of the theory is founded. In effect, what is argued is that man was adapted during the period to a perfectly peaceful mode of living, and to that only. Selfish and predatory inclinations were eliminated. Only if this were true would it be justifiable to argue that later behavior was a matter of habit. But it is not true. And it is not at all to be wondered at that in the barbarian era man turned out to be — according to Veblen — a very belligerent and rapacious fellow. Illustrations need not be multiplied. The facts are so improperly handled in Veblen's generalizations that his theoretical interpretation is not acceptable.

The theory is weak, moreover, on the institutional side. The forces that govern institutional change are highly complex. They are so legion, so varied, and so elusive that they cannot by any magic of the mind be brought within narrow purview. Yet Veblen presumes to account for the evolution of technology and ownership by some simple formula. As a matter of fact, fallacy is implicit in the attempt to isolate out of the total framework of institutions the so-called economic ones. For this is an isolation which leads inevitably to ignoring by far the largest part of the interactions among institutions to which the modern sociologist has given so much attention.⁷

There is no need to labor further with criticism. The integrated system of theory put forward by this irritating iconoclast is a very rickety affair.

It must not be concluded, however, that Veblen makes no contribution whatever to our economic knowledge. Some of his books are deserving of careful attention, especially those

7. Sumner and Keller, for example, in their *Science of Society*.

which deal with the operations of the existing system. Tho he takes into consideration only the conflicts of "business" and "industry," and tho he places entirely too much emphasis on this aspect of affairs, nevertheless he succeeds in bringing into the light things which are (or were) all too frequently ignored. The wastefulness of some forms of competition, the abuses of financial control, the prevalence of monopoly — these are some of the things which he submits to examination. The Theory of Business Enterprise cannot be considered a reliable textbook, nor even a trustworthy monograph, but it is a very stimulating and suggestive work, which rewards the reader's effort much more generously than most of the literature on modern business finance.

Similarly, the Theory of the Leisure Class is to be commended. Nobody would claim, of course, that it is of any particular merit as a scientific analysis of consumption. But it is suggestive. As such it has its value.

These contributions are not great. By far the largest part of Veblen's effort went toward the rebuilding of economic science. He tried to develop an evolutionary approach to the study of economic phenomena. His accomplishments have been outlined above and the more obvious weaknesses have been exposed. That his particular theory cannot pass examination does not mean, however, that the whole conception is wrong. For the economic problem may be conceived in two ways — what Veblen calls the taxonomic and the genetic ways — and the theory of economics may proceed from either of the two points of view.

Now it is not proposed here to debate the relative merits of these two types of theory. As was stated at the beginning, my aim is only to clarify the propositions, to try to render some of the points at issue more intelligible. Veblen's work, it has been said above, may be taken to represent the kind of analysis for which the institutional school presumes to stand. Evidently, then, the points about which a difference of opinion may cluster are points of approach and scope. The controversy between the "institutional" and the "orthodox" schools of theory is not concerned, as many have thought it

to be, with the felicity of statistical analysis, nor with the adequacy of the concept of equilibrium, nor with the merits of pure description. The real questions are those of defining the problem, settling upon a suitable mode of approach, and establishing boundaries of scope. In other words the question is whether economics is to be enlarged into a theory of social evolution. Thorstein Veblen's institutional economics is a theory of the evolution of those institutions which affect the production and distribution of wealth.

KARL L. ANDERSON.

JOHN WINTHROP HOUSE,
HARVARD UNIVERSITY

THE DEMAND FOR LABOR

SUMMARY

I. Marginal productivity ignores important forms of investment, 627; and is inaccurate even for "productive" investment, 628.— The "law" of diminishing productivity vague and subject to serious exceptions, 630.— Marshall's doctrine of marginal net product does not explain general wages, 631; but throws light on the process of equilibrium-seeking, 632.— The application of labor to land, 633.— II. "Demand for labor" a misleading expression, 634.— Factors which determine it, 635.— The "method of increments" not involved, 638.— In what sense wages are residual, 639.— III. Practical implications: for changes in working hours, 640; consumer borrowing, 641; raising of wages above equilibrium rate, 642; elasticity of demand for labor, 643.

The appearance of another book¹ accepting, and to some extent defending, the marginal productivity theory of wages is evidence of the continued vitality of this much debated doctrine. Tho shaken by many hard blows from realistic and practical critics, its adherents have yielded ground only to the extent of retiring in good order to the high-walled citadel of pure theory, confident that here, at least, is security. This confidence seems to me entirely unfounded. In the first part of this paper I shall set forth my reasons for holding this view; in the second part I shall endeavor to develop a positive theory of the nature of the demand for labor; in the third part I shall consider some of the practical implications of this analysis.

I

The first difficulty with the doctrine of marginal productivity is that it ignores one of the most important uses of investment funds. The only kind of investment which can influence wages is the efficiency-increasing kind — that which

1. J. R. Hicks, *The Theory of Wages*, Macmillan and Company, London, 1932. Since this paper makes no pretense of being a review of Professor Hicks' book, its generally critical tone should not be interpreted as a failure to find solid merits in his treatment of the subject.

increases the physical output of labor.² If all savings went into the scarcity-reducing channels, productivity per laborer would be the same whether there were many laborers or few, much investment per laborer or none at all. There would be no decline whatever in marginal productivity as the number of laborers increased.³ (I ignore the labor-land ratio for the moment.)

This consideration cuts the ground from under the theory. The amount of savings devoted to efficiency-increasing investment, and therefore their marginal productivity and that of the labor combined with them, can not be known until the strength of the "pull" towards the other type of investment is known. This means that wages are influenced by a third factor which is not included in, or suggested by, the marginal productivity formula.

It may be objected that the theory does not pretend to assert more than that wages depend upon the proportion between labor and *productive* capital, eliminating the other uses of savings on the ground that, in a given state of technique and demand, the relation between the various uses would always be the same, and hence productive investment would *vary* with total investment. Even if we concede this somewhat dubious point,⁴ it does not help matters. There remains the fundamental defect that the marginal productivity analysis makes no allowance for anything but diminishing physical productivity in its explanation of changes in the rate of interest and wages,⁵ and this is certainly not the whole

2. The distinctions involved here, and in fact the whole argument of which this paper is an elaboration, are developed in my *Value and Income*, especially Chapter VIII.

3. The per capita output of the society might increase, if people were induced to work harder as a result of access to new opportunities for consumption. Such a result is not necessary, however, and in any event the amount of the increase would bear no relation either to the rate of interest or to the rate of wages.

4. It would obviously reduce marginal productivity to an explanation of *changes* in wages, leaving the main question — the point of departure — as obscure as ever.

5. The attempt to explain distribution in terms of *value* increments will not bear examination. What labor or capital as a whole gives to society is increments of *income*, and these do not have value — a relative

story. Suppose a society in which only one use of savings is known, say a spade. Now every increment of investment in that society will add as much to the physical output, proportionately, as earlier increments, *until* the point is reached where the workers begin to receive a second spade to work with. Technically one spade helps its user as much as any other. A comparison of total outputs, therefore, will show no decline in the increment of product per increment of investment. Interest, however, can certainly fall under these circumstances, and wages as certainly rise. After the workers already in the spade-using trades have been equipped with spades it will be necessary to raise wages in order to recruit new *users* from other branches of production.⁶ This result will not be reflected in the physical increments because it is due to something else — to a disturbance in the value system. Now this increase of capital being equivalent to a decrease of laborers with capital fixed, it follows that the physical increments of product would not, under these conditions, correctly indicate the effect upon wages of changes in the number of laborers.

The significance of this conclusion arises from the fact that this duplicating of particular instruments is one of the typical ways of absorbing new investment funds in all societies. In fact, it is never abandoned in favor of instruments of lower physical yield until the interest-paying power of all the better instruments has been reduced to the level afforded by these less effective alternatives. It is therefore an ever-present factor in variations in the interest rate and the wage rate resulting from changes in the ratio between labor and capital.

concept — but utility. (To individuals, moreover, not to society.) We can speak of increments of value only in connection with the use of the factors of production in particular industries. This phase of the question is considered below, pp. 631-633.

6. The decline in interest resulting from this rise in wages is accentuated by the fact that it takes a larger share of the product to pay wages of a given value, the value of the product having been reduced by the expansion of output. This is sometimes referred to as the "diminishing value productivity" of the additional investment. Whatever may be said for this terminology, it is an error to suppose that the phenomenon which it describes is an adequate explanation of falling interest rates.

The inaccuracy of the increments of physical output is chronic.

Up to this point we have taken for granted the existence and the relevance of the "fundamental law" upon which the marginal productivity theory is based — the law of diminishing productivity. Now I do not propose to question the validity of the law as a formal proposition. The productivity of a given investment (i.e. the advantage in physical terms of a given process) depends upon two things — the cost of making the equipment involved, and the mechanical effectiveness of these instruments. Both of these factors being of an essentially technical character, there may be many combinations of them which give the same result, i.e. the same degree of productivity. It seems arbitrary, however, to assume that there is an infinite number which do this; and hence it is an acceptable generalization to say that "after a point" additional investment funds will have to find an outlet in processes of inferior productivity.

It is equally arbitrary, on the other hand, to assume that this "point" will be reached before all savings have been placed. This *may* be true in a particular case, or even typically in modern industrial societies, but there is nothing in the nature of capitalistic production to make it inevitable. We cannot say, therefore, that diminishing physical productivity is the basic factor in the decline of interest, and rise of wages, as productive capital increases. All we can say is that it will contribute to this result if it has been encountered. We certainly cannot infer its operation from an observed functional relation between the interest rate and the supply of capital; for as we have seen above, it is possible for interest to fall *without* any decline in physical productivity. Whether such a decline is a factor in a particular case is purely a question of technical fact.

A further difficulty is that the "point" at which diminishing productivity is encountered depends, in the case of labor, upon the way in which a given increase of supply takes place. Such a change is just as significant when it results from a lengthening of the working day as when it is a matter of more

workers, but its effect upon productivity and upon wages is very different in the two cases. In the first sense it has no effect on the supply of equipment available per worker — and hence no effect upon per capita output — until the equipment is being used twenty-four hours a day, or whatever limit is set by technical considerations. Where the working day is only eight or nine hours, therefore, it is possible to have a doubling of the supply of *labor* without any decline in its productivity.⁷ Similarly for increases of labor in the sense of increases in efficiency — working "harder" or acquiring greater knack and speed. An increase of the same magnitude resulting from a change in the number of *laborers* might well have serious effects upon productivity. A "law" which is operative only "after a point" is all too vague; one which permits as much variation as this hardly deserves the name.

Before concluding this part of the discussion a word should be said about a version of marginal productivity, familiar to readers of Marshall, which seems more acceptable to many economists. In Marshall's words, "the wages of every class of labour tend to be equal to the net product due to the additional labour of the marginal labourer of that class."⁸ Now no exception can be taken to this statement as it stands. It is certainly true that, when complete equilibrium has been attained, the laborers in every industry (or business) will be receiving a wage equal to, and in a business sense determined by, the value of the marginal laborer's addition to the product of that industry (or business). It does not follow, however, that this lends any support to a marginal productivity theory of the general level of wages. For as Marshall was careful to point out, we have to know all the other expenses of production before we can measure the marginal laborer's

7. For analogous reasons it is possible to have an increase in the number of *laborers* without affecting marginal productivity, provided a "doubling up" in the use of equipment is feasible, i.e. letting the newcomers use it during hours when it would otherwise be idle. Such a change, however, is best regarded as excluded by the assumption of "fixed conditions of production" which, of course, is always made in stating the law. Cf. page 643 below.

8. *Principles*, 6 ed., p. 518.

net product. In other words, we have to know the rate of interest, which means that the amount going to the laborers *as a whole* is also known. All that can now be discovered from the marginal net products is whether the labor supply has been economically allocated among the various industries. If it has not, the marginal net products will not be equal, and further readjustments will be in order. When these are completed, wages will indeed "equal" marginal net product, but they will not have been determined by it. They will have been determined by the forces which made total output large or small and the interest deduction from it more or less. Except for pointing to the importance of physical productivity,⁹ marginal net product does little to reveal the true character of the wage-making forces in modern economies.

This is not to say that it is of no interest to the wage theorist. Every major problem in economics raises two questions: what are the factors which determine equilibrium, and what is the nature of the process by which, in a given type of business economy, this equilibrium is arrived at;¹ and there is no reason for regarding one as more important than the other. Now in the case of wages the equilibrium-seeking process has two aspects. One of these — finding the most economical allocation of the labor supply — we have already noted and have considered the rôle of marginal net product in it. The other — finding how the product of industry is to be divided among the participants — also depends upon marginal net product, but the connection between them is much less obvious.

Let us assume that equilibrium is disturbed by an increase in the supply of labor. Our theory tells us that this will tend to raise the rate of interest and to lower wages, because sav-

9. Perhaps this is all that Marshall meant by his ambiguous statement that "the doctrine throws into clear light the action of one of the causes that govern wages," but some of his followers have found in it more substantial approval of the marginal productivity doctrine.

1. It seems to me that it would be a good practice to call analyses of the latter type "business economics." This would recognize their function of giving social meaning to the calculations and decisions of business men, and leave to "economics" the analysis of equilibrium. Failure to keep the distinction in mind has bedevilled many economic controversies.

ings will no longer have to be invested in such physically unproductive instruments as before, and investors will not have to bid up wages so much in order to recruit laborers from the non-capitalistic industries;² but it does not tell us how business men come to make these decisions. If the new laborers happen to distribute themselves among the various industries in the proportions required by consumer demand (i.e. if the allocation phase of equilibrium-seeking is ruled out) employers will find that marginal net product — increase in output times its unit value — will not justify anything like present wages. A wage-cut of such magnitude will raise the marginal net product of *savings* above the existing (unchanged) rate of interest in all industries. To take advantage of this, entrepreneurs will need more savings and more labor, and the price of both will therefore tend to rise. This will necessitate a revision of their estimates of the marginal net products, changes in the prices and uses of the factors, and so on until no further change will yield any profit. This, it seems to me, is the real rôle of the marginal net product as conceived by Marshall, so far as the general rate of wages is concerned. Like the allocation aspect of the equilibrium-seeking process, with which it blends indistinguishably, it bears no causal relation to the result.

So far as the application of labor to land is concerned, there is more to be said in favor of marginal productivity. It seems to be pretty well demonstrated that the output of a given plot cannot be expanded indefinitely at constant cost. Sooner or later there is diminishing return.³ This, of course, is not the point directly at issue when we are trying to explain wages in a given case. Labor must then be thought of as applied, not to a theoretical "flower-pot" of soil, but to all the land which that society possesses. What will happen to marginal productivity when a second laborer appears on the scene depends, primarily, upon the amount of land of the first

2. For simplicity I omit consideration of the readjustments called for in the non-productive uses of savings.

3. The possibility of an initial period of increasing returns is eliminated if we start, as for most purposes we should, with the optimum labor density.

quality which is available. The law of diminishing returns does not enter in unless and until this land is all utilized at optimum density; and after this point is passed there will be other "plateaus" of productivity as the poorer lands are resorted to.

Even as thus qualified, however, the law must be applied with caution. The extent to which a growing population is forced to spread out upon its inferior lands is partly dependent upon a third factor — the relative strength of the demands for land-using and non-land-using forms of consumption, the former increasing, the latter decreasing it. At first thought one is inclined to dismiss this as one of the "other things" which are assumed to be equal, but it is not quite so simple. The strength of the different demands depends on who controls the society's income, and this changes as the population grows, land-owners receiving more and more. This receipt of unearned income may incline them more to luxury and this may take the form of non-land-using consumption. The error involved in not taking account of this is probably not very great in most cases.

A second reason for caution is the uncertainty concerning the effect of longer hours. If the change results from the laborers' desire for more non-land-using products, it is evident that this increase in the supply of labor will not affect the margin of utilization. To the leeway for an increase of labor without bad effect upon wages is probably less here than in the case of capital, considered above, it cannot be entirely ignored. To rule it out as contrary to the assumption that "tastes" are stable — a dubious procedure — is to risk losing sight of it altogether.

II

The expression "demand for labor" is a rather unfortunate one. It suggests that the practices of a capitalist-entrepreneur economy have some fundamental bearing upon the problem of wages, that wages are high or low because somebody "wants" labor intensely or the contrary; whereas the buyers of labor are really only the channels through which the true

wage-making forces work.⁴ It also obscures the fact that there is not *one* demand for labor but several — as many as there are feasible lengths of the working day or week. This is the only way to take account of those changes in the "supply of labor" which reflect the habits of the laboring population, changes which have just as many interesting interactions with "demand" as variations in the number of laborers have. Graphically this would have to be depicted on a surface stretchable horizontally to show the different amounts of labor demanded at the various wage rates as the working hours are changed: twice as many units when the hours are twelve hours per day instead of six.⁵

Despite these misleading implications, it is perhaps just as well to continue to speak of the "demand for labor," in order to avoid too sharp a break with customary usage. It serves to sum up, more succinctly if less accurately, the numerous interacting forces which enter into the determination of wages. It is in this sense that I have used it in the title of this paper. To set forth fully the nature and operation of these forces would require a whole treatise on distribution. All I can do here is to supplement what I have written elsewhere by stating my conclusions from a somewhat different, and perhaps more illuminating, point of view. The "demand for labor," as I see it, is the resultant of the following:

(1) The character of the laboring population, understanding by this their speed, stamina, and perseverance. These clearly influence the laborer's output, and his output sets obvious limits to what he can hope for as a wage-earner.

(2) The known techniques for the organization of labor. The division of labor, being an important factor in industrial output, has the same direct and obvious bearing upon wages as the foregoing. The only difference is that the successful functioning of organized production requires the services of

4. It was this attempt to explain wages in terms of "demands" of entrepreneur-capitalists which caused the classical economists to waste so much time over the fruitless wages-fund concept.

5. Ignoring for the moment the possibility that these increases in working hours may react unfavorably upon the labor-land ratio, which complicates matters still further.

supervisors who have to receive something for their time ("wages of management"), thus leaving less for wages in the narrower sense.

(3) The character and extent of the natural resources at the disposal of the laborers, meaning by "character" both the qualities of the resources and the proportions in which the various qualities are present, and by "extent" not the absolute amounts, but the per capita amounts of the available resources. The first influences wages through its effect upon output. That "nature labors along with man" in the extractive industries has long been understood, and the success of his efforts naturally depends as much upon the effectiveness of his collaborator as upon his own capacity and organization. The second influences wages by determining the points at which additional workers are forced by diminishing returns to turn to successively poorer grades of land, thus reducing the alternative facing any dissatisfied worker and compelling all, under a system of private ownership of land, to accept correspondingly reduced wages.

(4) The amount of investment funds available; not the absolute but the per capita amount. The greater this total, the greater the amount devoted to productive investment, and therefore the greater the output of laborers of given quality and organization using given natural resources. Whether the laborers will be able to get any of this additional output, and how much, depends upon the next two factors.

(5) The nature and extent of the known methods of investing savings productively. By "nature" I mean the physical productiveness of these methods: the ratio between their labor equivalents (the labor they "save") and the labor (represented by savings) which has to be invested in them; by "extent" I mean the number of these methods and the number of branches of production to which they are applicable. The former affects wages by increasing the amount of additional output from which the laborers can hope to draw an increase of wages. The higher the productiveness of a given investment channel, the more the investors can afford to pay for the purpose of recruiting *users* of capital from other

industries and thereby avoiding alternative channels of lower productivity. This bidding up of wages is necessary because the loss of labor in the industries drawn on will cause a relative scarcity of output there, higher values for the products, and hence higher wages for the workers remaining. The influence of the extent of roundabout methods is most easily discussed in connection with the next point.

(6) The nature of the society's demand — what things are wanted and how strongly. This affects wages in several different ways:

(a) Together with the number of known techniques and the number of industries to which they are applicable, it determines the amount of savings which can be invested at each of the several rates of physical productivity without forcing interest down and wages up. Since demand for commodities determines the number of workers in a given branch of production, it determines the amount of equipment of a given sort which can be introduced in that branch without bringing in labor from other industries and thus raising wages. The greater the demand, therefore, for goods producible by the various capitalistic methods, the slower the drop in interest, and the rise in wages, as savings seeking investment accumulate.

(b) The rise in wages resulting from a given attempt to recruit workers from other industries — i.e. from an attempt to find employment for a given amount of "overflow" savings — will depend on the nature of the demand for the products of these industries. If the demand is inelastic, wages will be forced up more rapidly by an increase in savings.

(c) Next there is the obvious influence of demand in determining the outlet for savings in industries where "waiting" is a necessity rather than an alternative to simpler methods. The greater the demand for such products, the greater the amount which can be sold at a given price, and hence the greater the amount of savings which can be used in these industries at a given rate of interest. This, of course, means that less savings will be used productively, and that wages will benefit less from a given supply of savings.

(d) As we saw above, the demand for goods may incline more or less towards those requiring the use of land. The stronger this preference, the lower the margin of utilization is forced and the farther wages tend to fall.

(e) Finally comes a somewhat different aspect of demand—the desire to anticipate future income. Since this constitutes a part of the demand for savings, it helps to determine the extent of productive investment. Where it is strong, therefore, wages are lower than they would otherwise be.

At several points in the foregoing discussion I have explained the relation between the supply of labor or of savings and the earnings of these factors by describing the reactions consequent upon *additions* to these supplies. At first glance this sounds so much like the "method of increments" used in the marginal productivity theory that the reader may well ask whether my reasoning is not equally open to one of the objections raised against that doctrine—that its results are indeterminate, being dependent upon the size of the increment added to the supply.

So far as my handling of the labor-land ratio is concerned, the difficulty does arise but is negligible. It is true that the output *per hour* is smaller when the "last unit" of a million hours' supply is very small, say one hour, than it would be if the increment were large, say a tenth of the whole supply. The average quality of the land used by the larger increment would be higher. An increment of this size, however, is inconsistent with full competition in this case. Since the competitor is the man, not the block of labor, the widest range in the size of the increment which we can assume is from no hours per day to a full day's work. This is so small in relation to the total supply of labor, ordinarily, that its effect upon the output per hour must be too small to take into account.

The case is very different when we come to deal with the labor-capital ratio. Here there is no natural limit to the amount of the factor (savings) which an individual may be supposed to control, or even to the amount by which he may

be supposed to increase his holdings.⁶ Hence there is no limit to the size of the increments by which the total supply may be supposed to accumulate, whether we assume it to be by the addition of new *savers* or of new *savings*. Whatever weight should be given to this objection in the case of marginal productivity, it has no bearing upon my reasoning. That theory argues that interest falls because successive increments of capital, having smaller and smaller productivity, are less and less able to pay interest, making it necessary for all increments to accept less; whereas I have maintained that all units of a given amount of invested savings have the *same* ability to pay interest. The more productive processes are duplicated until earnings (above labor cost) fall to the common level. Earning power per unit is therefore the same whether the savings are applied in small "doses" or large ones. In other words, interest does not depend, even in productive investments, directly or solely upon physical productivity. Neglect of this point leads to great confusion.

The most convenient way to summarize the above analysis is to say that wages are the physical product of industry, as determined by personal, environmental, and technical factors, minus what the landowners and investors are able to retain under the existing conditions. If this formula tells us little in itself, it at least calls attention to the variety of forces at work and the complexity of their interaction.

The residual form in which it is phrased may seem arbitrary to some readers. Can we not just as well say that interest is the product of industry minus what the landowners and laborers are able to retain? If these statements were offered as *explanations* of the rate of wages and of interest, they would obviously be absurd, since they make interest depend upon a magnitude — wages — which depends upon interest. But they are not offered as explanations. They merely say that the whole is equal to the sum of its parts. Wages, interest, and rent are explained by a common set of factors; they do not depend on each other. It is not a matter

6. There would be such a limit if the increase had to come from his income as a laborer, but of course it does not have to.

of complete indifference, however, which type of income we describe as the residual share. In an entrepreneur economy, it is rather misleading to speak of the laborer as "retaining" or "holding back" anything from the other participants in production. One of the latter—employer-landowner or employer-capitalist—is much more likely to obtain first possession of the product and to do the intercepting. The real determinants, however, are the same in any event.

III

The practical implications of the foregoing analysis are many. It clears up some important aspects of the controversy over hours; it helps to evaluate certain forms of investment from the point of view of the laborers; it gives a more fruitful content to the concept of elasticity of demand as applied to labor. In short, there is hardly a question of policy on which it does not bear. I shall discuss only enough of these implications to show their variety.

Perhaps the most obvious is the effect of longer hours on the welfare of the laboring classes as measured by incomes. Since longer hours do not affect the labor-capital ratio or any of the other wage determinants except the labor-land ratio, their only injury to the laborer must come, apart from deleterious effects upon his efficiency, from the latter ratio—from forcing resort to poorer land. In all other respects there is no conflict of interest between laborers and capitalists, the former receiving more income from working more hours at the same rate,⁷ and the latter from the more nearly complete utilization of their equipment.

It is not at all certain that the land-labor ratio will be affected unfavorably to the laborers. Such a result, as we have seen above, depends on how the laborers spend their additional income. Since one of the normal outlets for this is an improvement in the quality of the things consumed—a non-land-using good, being mostly a matter of time and

7. This assumes, of course, that the increase in hours is general. If it applies only to some industries, there are obvious possible complications from oversupply.

skill — wages may not be depressed at all. It is quite possible, moreover, to extend the utilization of land without encountering harder terms, provided there is plenty of land, or uses of land, of marginal quality still free, a not improbable state of affairs. In any event, it is unlikely that a moderate increase in working hours can have much effect on the margin; and since the employers will profit from the change, there is every prospect, especially in a dynamic society, that it can be introduced without affecting wage rates.

All this, however, applies only to society as a whole. An increase in working hours in a part of the society, assuming its labor to be equally efficient, increases the yield on investments there and thus puts the community in a more favorable position in the competition for capital. This will react unfavorably upon laborers elsewhere. Capital being rendered less plentiful among them, wage rates suffer. Of course, the longer hours in a given section may merely compensate investors for lower efficiency of labor, but such inequalities in working conditions may well be an object of suspicion to the laboring classes.

Somewhat analogous reasoning applies to certain forms of investment — those which do not increase labor's output and hence cannot raise wages. Here it is not a question of drawing savings from one part of the society to another, but of drawing them from one investment channel to another. The effect upon wages is the same as in the handicapped communities just considered. The growth of such kinds of investment must therefore be regarded as unfavorable to labor. They take several forms. Most obvious is the financing of war or the purchase of military and naval equipment. Unless offset by extra saving prompted by patriotism or "forced" by inflation, such uses of savings cannot but lessen the per capita equipment of industry, thus tending to reduce wages.⁸ All forms of consumer borrowing have the same effect, whether the goods are of a perishable character or not. This,

8. If the lending country is itself actively engaged in military operations, the withdrawal of men may offset, for the time being, the diverting of savings from productive investment.

apart from its tendency to stimulate overexpansion in certain lines, is the chief argument against installment selling, but we find no inkling of it among the apologists for such loans. Unless we have evidence that it stimulates saving on the part of purchasers — i.e. that it does not simply replace other consumption — installment selling must be regarded as a very mixed blessing from labor's point of view.

The difficulties involved in the concept of a demand for labor are especially troublesome when we try to use it to predict the volume of employment — how much labor can be "sold" at a given price. This arises in connection with the raising of wages by government fiat or monopolistic dictation above the level which would otherwise prevail. In such cases, it is often maintained, more or less unemployment is inevitable, the precise amount depending on the elasticity of the demand for labor. This conclusion does not always hold good, i.e., it is true only under certain assumptions; and even when it is correct, it is not as helpful as it should be. It drops the problem with the analysis only half finished.

Under a system of free enterprise, the only way a rise in wages can occur, *assuming fixed conditions of production and demand*, is through a change in the labor-capital ratio. There being no reason to suppose that the passage of a law raising wages will increase the supply of capital, the desired effect upon wages must come about through a change in the labor term of the ratio, i.e. through a decrease in the amount of labor which is combined with the existing capital. In other words, the law commands that the settlement reached between laborers and investors shall be the same as would have been arrived at if a certain number of laborers had vanished. In effect they have been declared ineligible for employment. In the terms of the analysis developed above, certain investment channels have now been closed to the saver — providing equipment for these "disqualified" workers — and funds must now flow into other and less advantageous channels — providing additional equipment for the remaining workers.

— thus lowering the rate of interest and raising wages.⁹

Up to this point our conclusion is not essentially different from the generally accepted one: attempts to maintain artificially high wages will result in more or less unemployment. The statement is easily misunderstood, however, unless the conditions under which it holds good, italicized above, are carefully borne in mind. The expression "fixed conditions of production" is likely to suggest the physical aspects of the matter — techniques rather than customs or usages. Now with only these factors assumed to be constant, we cannot say that artificially high wages will result in unemployment. The surplus workers — surplus according to the argument just presented — can all be absorbed by using double shifts on some or all of the equipment which continues in use, and can be paid the new higher wage. Their use of the equipment does not alter the labor-capital ratio. In other words, the "conditions of production" must include the habits and preferences of the laborers as well as techniques. Only by making this clear can we render practical judgments which tell the whole story.

The number of workers left without employment will depend, it is ordinarily pointed out, upon the elasticity of the demand for labor. This is correct enough but not very helpful. The elasticity of demand is not something which can be measured directly; it must be known either by its works or by observation of the factors which determine it. Now the first method has the merit of accuracy, but it affords guidance only for reasonably similar cases. It is desirable, therefore, to seek what light we can from the second method — resolving elasticity into its constituent factors and measuring the latter.

It should be noted, at the outset, that what matters is not

9. The modus operandi is of course not so simple. The abandonment of certain operations comes because they would be losing ventures at the new wage rate, even if the interest rate fell somewhat, since they use no capital or relatively little of it, whereas there are others that could "break even" if they could obtain more elaborate equipment, or capital for longer processing, at only slightly less than they have been paying. The latter are obviously more attractive fields for investment.

the elasticity of the demand curve in general, but its elasticity within the relevant range, i.e. between the point of present equilibrium and some other point reasonably distant from it. In this sense we may say that the chief conditioning factors are (1) the relative importance in the society of industries using little or no capital, (2) the extent to which investment has been carried, i.e. its per capita supply of productive instruments, and (3) the nature of the sub-marginal instruments known to the society. These affect the elasticity of the demand for labor because they determine the volume of investment funds which can be absorbed without causing the rate of interest to fall, or the rate of wages to rise, more than a given amount. Since nothing very definite can be discovered about the third, in most cases, we may concentrate attention on the other two.

The importance of the first is easily shown. An arbitrary raising of wages will be detrimental to all industries using no labor, because it increases their costs without allowing them any loop-hole in the way of reduced capital charges. Loss is inevitable unless production is curtailed. The greater the extent of such industries, therefore, the more exposed will the society be to the danger of unemployment — i.e. the more elastic will be its demand for labor¹ — unless the demands to which these industries cater are exceptionally inelastic. The industries using little capital are also hard hit by the raising of wages, the major element in their costs being increased to a degree which is not offset by any probable saving on their capital costs. Their presence, therefore, also points to elasticity in the demand for labor at this point: the more there are, the greater the curtailment likely to result from a given increase of wages.

The influence of the second factor — the per capita supply of productive instruments — is somewhat less obvious. One of the outlets for additional investment funds is the duplication of existing types of capital with a view to their use by laborers recruited from other industries. Now this is one of

1. This seems to be the conclusion of Professor Pigou (*Economics of Welfare*, 2d ed., p. 624), but he puts it differently.

the uses to which savers withdrawing from industries rendered unprofitable by the increase of wages will be obliged to turn. The more such opportunities there are, therefore, the slower will be the fall in the rate of interest, and the rise in wages, as investors readjust themselves to the newly imposed conditions. More capital will be shifted, and more unemployment result, before a new equilibrium is reached. Numerous and expensive instruments of production mean elasticity in the demand for labor at that point.

The above reasoning, it is evident, assumes that we are dealing with a "closed" society, that no export of capital has to be reckoned with. The elimination of this assumption requires no substantial change in our conclusions. If investors are free to withdraw their funds, the volume of unemployment resulting from the fixing of artificially high wages is likely to be all the greater. The first effect of the policy will be to reduce the return on investments to a rate lower — at least relatively² — than can be obtained elsewhere. This will tend to drive capital away, as in the case of a tax on funded incomes, leaving that much less to finance the industry of the country. How great this outflow will be depends on the elasticity of the demand for savings in the rest of the world and the reluctance of savers to entrust their funds to foreign borrowers. The latter consideration may be of considerable importance, even in a country which is already an exporter of capital, if little domestic capital is owned by persons willing to "take a chance" abroad. To pay the newly imposed higher wage with this decreased supply of capital it will be necessary to reduce proportionately the amount of labor combined with it. In other words, there will be more unemployment than there would have been otherwise.

These illustrations will suffice to show that it is no less important from a practical standpoint than from a theoretical one to analyze and re-analyze "economic forces" until we have resolved them into their constituent factors and discovered how each of these factors contributes to the general

2. Not always absolutely, since the country may not have been on a par with other countries in this respect to begin with.

result. If "demand for labor" is nothing but a collective name for the sum of the conditions which determine wages, we shall be as helpless to advise the statesman or business man as we are to deepen our theoretical insight, unless we keep that fact in mind. And if the law of diminishing productivity operates after a point which may be of no practical significance and whose position is in any event uncertain, appeal to it will only make our warnings less convincing and our predictions more vague. That we need all the conviction and all the precision we can get is only too apparent in these embarrassing times.

A. E. MONROE.

HARVARD UNIVERSITY.

GOLD PRODUCTION AND THE PRICE LEVEL: THE CASSEL THREE PER CENT ESTIMATE¹

SUMMARY

I. The Cassel method, 647.—Kitchin's estimate, 648.—II. The problem of the base years: cyclical complications, 649; wholesale vs. general prices, 653; international aspect, 654.—III. The problem of the "normal" gold supply, 655.—IV. The problem of the rate of increase in the demand for gold, 658.—The first sub-assumption, 659; the second, 660; the third, 660.—Bank currency: England, 665; France, 669; Germany, 671; United States, 675.—V. Conclusions, 677.

I

The problems of prediction and control of the course of the price level involve some estimate of the rate of increase of gold which will maintain a stable price level, and it was in an attempt to ascertain what this "normal" rate of increase was during the period before 1913 that Cassel developed his method of attack. In point of time Cassel's work on this problem was of course not the first,² but it was probably more comprehensive than anything that had been done before, and the method on which it was based was quite new.³

While studying the Sauerbeck index Cassel was "struck

1. For criticism and advice the writer is indebted to Professors W. L. Crum and S. E. Harris of Harvard University, W. C. Beatty, W. A. Brown, Jr., and A. F. Hinrichs of Brown University, M. M. Bober of Lawrence College, C. J. Ratzlaff of Lafayette College, and above all to Prof. John H. Williams of Harvard University.

2. See, for example, Giffen, *Essays in Finance*, 92–95, 97, 334–338; *Essays in Finance, Second Series*, 86–87; Sauerbeck's evidence before the Gold and Silver Commission, First Report (1887), questions 935–942 (p. 50); and Aupetit, *Théorie Générale de la Monnaie*, 276–281.

3. The original memoir is found in 6 *Ekonomisk Tidskrift* (1904), 311–331. For interpretation of this article the writer has relied on the discussion of it which is found in an article by R. H. Hooker, "Course of Prices," 75 *Journal Royal Statistical Society* (1911), 23. The source that has in the main been consulted for the purposes of the present paper is Cassel's *Theory of Social Economy*, 438–454, 467–473. A summary of Cassel's views, together with some new material, appears in the Interim Report (1930) of the Gold Delegation of the Financial Committee, League of Nations, 71–78.

at seeing that the general level of prices was nearly the same height in the years 1850 and 1910."⁴ The average for the period 1848-1851 was 76, and the average for the period 1908-1911 was $76\frac{1}{4}$. Since the price index stood at the same level in these two periods, the gold supply (statistics of which were secured by cumulating annual production, less an allowance for waste) must have been "normal," he reasoned, and an increase in the gold supply during the intervening years at a constant rate, being merely that rate which was necessitated by the general economic development of the period, would have maintained a stable price level. In 1850 the gold supply was, he estimated, 10,000 million marks, and in 1910 it was 52,003 million marks. This represents an annual compound rate of increase of 2.79 per cent. Allowing for a yearly loss due to wear and tear of 0.2 per cent, the normal rate of increase for the period 1850-1910 becomes approximately 3 per cent.⁵

Using the same method, but gold money statistics rather than statistics of the gold supply, estimates of the normal rate of increase of the gold money supply were made by Kitchin in his work for the Royal Commission on Indian Currency and Finance and for the Gold Delegation of the Financial Committee of the League of Nations. According to the more recent of these two studies the normal rate of increase of the gold money supply in the pre-war period was 3.1 per cent.⁶ Except for maintaining that the Cassel method should be applied to gold money rather than to gold statistics, Kitchin accepts the Cassel method without reserve. And since the main interest of this paper is in the logical validity

4. *Social Economy*, 441. In his original study (1904) Cassel used 1850 and 1900 as base years.

5. *Social Economy*, 441-445, 450-451.

6. Royal Commission, 3 Report (1926), 521-524. Gold Delegation, Interim Report (1930), 79-85.

It is obvious that the "normal" rates of increase of the gold and gold money supplies have been the same only if the proportion of the gold output which has gone into monetary channels has remained constant, and Kitchin's statistics show that this has not occurred. The proportion of the annual gold output claimed by the arts and by the Orient has varied within wide limits. See Royal Commission on Indian Currency and Finance, 3 Report, 534.

of the Cassel method, Kitchin's work on the problem will not be examined in detail.⁷

This method is, undeniably, ingenious. It is based, however, on three assumptions, the validity of none of which has as yet been systematically investigated. The first of these assumptions is that it is possible to select two points in time, separated by a period of some years, at which prices stood at the same level. The second is that it is possible to determine what are "normal" quantities of gold for the years in which prices stood at the same level. And the third is that throughout the entire period studied, the demand for gold was increasing at a constant rate. If these three assumptions are supported by the facts, the Cassel method of determining the normal gold growth requirement is probably a valid bit of statistical methodology, but not otherwise. The present paper is devoted to a critical examination of the validity of these assumptions and of the way in which Cassel meets the problems involved in them. Since his study was confined to the pre-war period, the statistics examined in the course of this investigation will, for the most part, be confined to the period before 1913.

II

At first glance the assumption that a period can be selected at the beginning and end of which prices stood at the same level, appears to offer little in the way of difficulties. Since the relation between gold production and prices is one between gold and the trend of the price level, it would seem obvious that for our purposes prices stand at the same level in two different years when the values of the trend of the price index in these years are the same. While Cassel does not discuss the problem explicitly, this solution follows directly from the fact that the relation between gold production and prices is one between gold and price trends, and this he does recognize. He says, for example, "The relative gold-

7. The Cassel method was also used by Edie in his study of normal growth requirements for the United States. (37 *Journal Political Economy* (1929), 1-30.) Edie considers the Cassel method logically sound. See *ibid.*, 2-3, and see also his *Gold Production and Prices*, 54-56.

supply mainly controls the secular fluctuations of the general price-level, but it has no influence on their immediate movements."⁸

Unfortunately, when Cassel came to choose base years he completely forgot the distinction between the secular and the cyclical to which he had called attention, and selected base years in terms of an entirely different concept, one which is perhaps best set forth in his own words. After noting that the Sauerbeck index stood at approximately the same level in 1850 and 1910, Cassel continues, "In such a comparison, however, it is important that we do not simply take two isolated years, but consider also the subsequent years. We find that the average of the index-figures for the four years 1848-1851, which follow the crisis of 1847, is 76, while the corresponding average for the four years after the crisis of 1907 (or for 1908-1911) runs to 76½."⁹ How long the period of years should be he nowhere considers, even tho the average of any magnitude as unstable as a wholesale commodity price index obviously depends in part on the length of the period chosen. Nor does he consider the problem why periods of years are to be used rather than single years.¹ It seems to be implied, however, that before two years can be used as bases

8. Social Economy, 447-449. See also *ibid.*, 452, 458-460, 461, 467, and Interim Report of the Gold Delegation, 73, 75.

Kitchin and Edie also stress the fact that it is the trend of the price level that is significant for this problem. In describing one of his charts, Kitchin speaks of "trade cycle variations which are superimposed on the fundamental movements or trend produced by the varying Stock of Gold Money." (Royal Commission on Indian Currency and Finance, 3 Report, 524. See also *ibid.*, 522-523, and Gold Delegation, Interim Report, 80.) And Edie, who appears to be a disciple of Cassel and of Kitchin, writes in similar vein, "Consequently short-time fluctuations of the price level cannot be attributed to changes in current production. It is only the secular trend of prices which correlates with the secular trend of gold production." (Gold Production and Prices, 46. See also *ibid.*, 37, 54.) In choosing base periods, however, both of these writers failed, as Cassel did, to work in terms of the trend of the price index.

9. Social Economy, 441.

1. Kitchin used base periods of three years in his study for the Royal Commission on Indian Currency and Finance, and in his study of normal growth requirements for the United States Edie used periods of one and of three years. Neither of these writers considered the problem of the length of the period to be used.

for a study of normal growth requirements, they must occur in periods of years, and evidently relatively short periods, during which the price level has been reasonably stable. When this condition is fulfilled, the implication is that the years reflect underlying conditions fairly, and their agreement is due to something more than mere coincidence. It is of course obvious that if the relation between gold and prices is one with price trends, this second concept of when the price level stands at the same height in different years is not at all valid, for a price index may be stable for three or four years and still be significantly above or below its line of trend.

If the periods chosen by Cassel as base periods are examined, however, it becomes evident that even in terms of this second and seemingly indefensible concept, they are not at all comparable, even tho their averages are the same. The first period does exhibit a marked degree of stability, the index running 78, 74, 77, and 75. But in the second period the trend of the index was distinctly upwards, 73, 74, 78, and 80.²

If we work in terms of the first concept and consider the trend of the price index, it is evident that here again Cassel's work is open to criticism. Study of the Jevons-Sauerbeck index (Chart 1) shows that in the period 1848-1851 the index was very obviously below its line of trend. These years were at the bottom of a pronounced cycle, and for this decline in prices adequate reasons are not hard to find. In 1844 the English banking system was reorganized, and the issue of bank notes restricted. In 1845 and 1847 there were failures of the potato crop in Ireland, in 1847 England passed through a major banking crisis, and in 1848 there occurred several political revolutions upon the continent. In view of these

2. The same criticism can be made of one of the base periods, 1883-1885, used by Kitchin in his study for the Royal Commission on Indian Currency and Finance. (3 Report, 524.) In these years the course of the price index was 82, 76, 72, a fall of ten points, or over 12 per cent in three years. Similarly the use in Cassel's early study (6 *Ekonomisk Tidskrift*, 311-331) of 1850 and 1900 as base years would seem hard to defend. The 75 of 1900 was a purely isolated high point in the course of the price index, being preceded by 64 in 1898 and 68 in 1899 and followed by 70 in 1901 and 69 in 1902.

happenings, all of which would tend to lower wholesale commodity prices quite regardless of gold conditions, it is not surprising to find the price index markedly below the 84 which is perhaps a fair trend value for 1850.

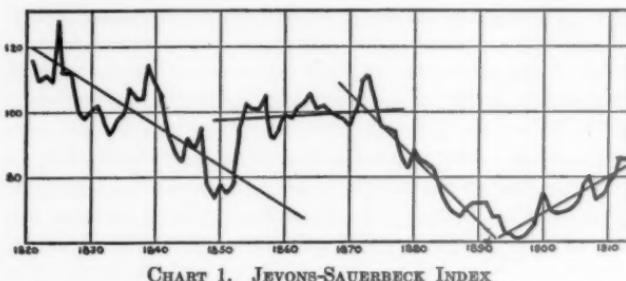


CHART 1. JEVONS-SAUERBECK INDEX

A second reason for believing that 84 is a fair trend value for this period, as opposed to Cassel's 76, is the fact that the Sauerbeck index is a wholesale commodity price index. Now on theoretical grounds the use in any study of the long-time value of gold, of a wholesale commodity price index may leave much to be desired. True, the only indexes that extend far enough into the past to be available are indexes of this type. But if practical considerations force the use of a wholesale commodity price index, it should not be forgotten that this type of index is sensitive. This is especially true of indexes, such as the Sauerbeck index, which are based on the wholesale prices of a relatively small number of commodities, all of which are either raw materials or commodities in which the degree of fabrication is slight.³ In view of these considera-

3. Comparison of Snyder's general index for the period 1875-1913 with his wholesale index for the same period gives a concrete illustration of this sensitivity. (Chart 2.) Trends appear in rents, wages, retail prices and interest rates, but their cyclical fluctuations are not pronounced. Especially illuminating is the course of the Snyder general and wholesale indexes in the period 1888-1900. This period bridged the turning point in prices of 1896 as the period 1848-1851 did the transition point of 1849. During the period 1888-1900 the general index was quite stable, but the wholesale index showed a marked drop, just such as occurred in the Sauerbeck index in the period 1847-1852. Between the

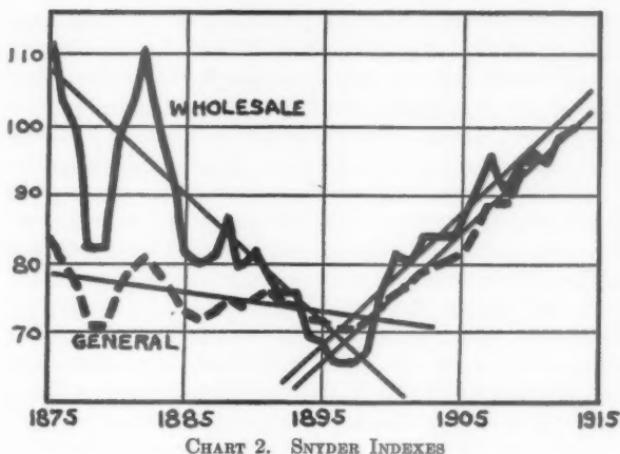


CHART 2. SNYDER INDEXES

tions, it would seem to be sound policy to discount any sharp rises or falls that the Sauerbeck index shows, for much of its movement has probably not been due to those secular forces in which our interest lies. Beyond doubt 76 is far too low to be called the secular level of prices in 1850.

As for the second of the two periods which Cassel calls "normal," a glance at the Sauerbeck index (Chart 1) shows that the trend value for 1910 is about 79. This is roughly 3 points above Cassel's $76\frac{1}{4}$, a difference which cannot safely be called insignificant. Consequently, if the trend of the Sauerbeck index is considered rather than the actual values of the index, it is evident that prices did not stand at the same level in 1850 and 1910. Between the values of the trend of the index in these two years there is a difference of about 5 points, or nearly 6 per cent.

A further difficulty is encountered if it is believed that the actual values (as contrasted with the trend values) of the two Snyder indexes there was in the year 1896 a difference of 5 points, or over 7 per cent of the wholesale index in that year. And between the actual value of the wholesale index in 1896 and the trend of the general index in that year, when the trend is fitted to the period before 1896, the difference is even more pronounced, amounting to about 7 points or over 10 per cent.

price level should be defined in terms of all prices and not wholesale commodity prices alone. This is because there is some evidence that wholesale and general indexes not only differ in the amplitude of their fluctuations, but may have very different trends. Consequently the trend of a wholesale price index may not be an accurate guide for choosing base periods. The trend values of the wholesale index may be very different from what the trend values of the general index, if available, would be. Comparison of the Snyder general and wholesale indexes, for example, shows that in the period 1875-1896 the trend of the general index was only moderately downwards, while the trend of the wholesale index was quite sharply downwards. (Chart 2.) In this connection the experience of the period through which we have just passed is also illuminating. From 1921 to the summer of 1929 a fair degree of stability characterized the wholesale commodity price index. The trend was slightly downwards. Yet in these years the trend of wage rates and of security prices was markedly upwards, and the general price level rose at about the same rate as the wholesale price index fell.⁴ In the period 1896-1913, while the trends of the Snyder general and wholesale indexes appear to have had about the same slope, they were far from being identical. (Chart 2.) As a result of these differences, the trend values of the Snyder wholesale index were the same in the years 1879 and 1912, for example, but in these years the trend values of the general index were 77 and 96. As to what the relation between general and wholesale prices was in the years before 1875, one can only guess; but confidence in the Cassel method of computing the normal rate of increase of gold is certainly not increased by Snyder's findings. The problem is vastly more complex than Cassel has pictured it.

A final difficulty is the international aspect of this problem. The value of gold is, of course, a problem in world value, yet any attempt to take more than one index into consideration meets the difficulty that the indexes of different countries often move in quite different ways, because of actual differ-

4. See Mills, in *Recent Economic Changes*, II, 632.

ences in the movement of prices themselves (caused by the flow of capital, etc.), differences in the way in which these movements in prices have been measured, or both. As is well known, this is true of even those wholesale commodity price indexes which are heavily weighted with, if not almost entirely constructed from, the prices of international commodities. Consequently periods which are in a "normal" relationship in one country may be far from this in other countries.⁵

As a result of the foregoing analysis, it becomes evident that the problem of determining in what years prices have stood at the same level is not at all a simple one. If the relation between gold and prices is one with price trends, and if agreement can be reached as to the kind of index on which the study is to be based and what are correct trends for this index, then it is probably valid to assume that two years can be chosen in which prices have stood at the same level. But as the foregoing analysis has shown, it can hardly be said that Cassel has in practice followed his own theory. His choice of base years would seem hard to defend.

III

The second assumption made by the Cassel method is that after years have been selected in which the price index stands at the same level, it is possible to determine what quantities of gold are "normal" for those years. This assumption obviously raises the problem of lag. If a lag exists between

5. An interesting example of this is found in Edie's study of normal growth requirements for the United States. (37 *Journal Political Economy* (1929), 4.) The Cassel method was used and the period 1884-1907, the second half of one of the two periods on which Kitchin based his study for the Royal Commission on Indian Currency and Finance, was the first period chosen. The three-year averages of the Sauerbeck index centered on 1884 and 1907 were the same. But if the Snyder wholesale index and the Bureau of Labor Statistics wholesale index are spliced to form an index which is continuous over the whole of the period being studied, the three-year average of this American index centered on 1884 is 86, and the three-year average centered on 1907 is 91. Here is a discrepancy of 5 points, or over 5 per cent. A difference of this magnitude would seem to call for some explanation, yet about it Edie said nothing at all.

changes in the rate of growth of the gold supply and changes in the trend of prices, the amount of gold that is "normal" for any given year is not the amount in existence in that year, but the amount in existence as many years before the base year as the lag is long.

On *a priori* grounds it seems probable that there does exist some lag between variations in gold production and in prices. Some time must elapse for the rate of growth of bank currency to become adjusted to the altered rate of growth in the gold supply, and for this altered rate of growth in the entire circulating medium to affect the price level. And, as is commonly known, this reasoning is borne out by the facts, study of the statistics showing that in the past the trend of prices has not changed till some time after gold production has markedly changed. It was doubtless these considerations that led Cassel to call attention to the existence of lag and its importance in the problem of the relation between variations in gold production and trends in prices. He says, for example, that it is "probable that variations in the gold-supply only show their full effect in proportional changes of the general price-level in the course of time."⁶ Yet he averaged the price index for the years 1848-1851 and 1908-1911 and then used the gold data for the years 1850 and 1910. In other words, no allowance was made for lag.⁷

6. Social Economy, 447; see also 437.

7. In one of his early studies Kitchin allowed "for the fact that the increase in the world's aggregate stock of gold money takes five years (more or less) to produce its effect" on prices. (3 Review Economic Statistics (1921), 260.) But in his work for the Royal Commission on Indian Currency and Finance, tho he again called attention to the existence of lag, no allowance was made for it in his estimates. (3 Report, 521, 524, 525.)

In his study of the problem Edie writes that this "intervening lag is of great importance in estimating the correlation between gold and prices," and estimates its length as being from five to ten years. (Gold Production and Prices, 47.) Ten pages earlier in the same study he speaks of this lag as being from four to seven years, but the discrepancy between these two estimates he nowhere explains. Not only did he accept the work of Cassel and of Kitchin without question, but in his own study of normal rates of increase for the United States (37 Journal Political Economy (1929), 1-9) he made no allowance for lag.

Aupetit is a fourth writer who, in a study of this same problem, like-

At first glance the problem of the length of this lag appears to be an easy one. The number of years by which changes in the trend of prices have lagged behind marked changes in gold production is the solution. This is the way in which the problem has been attacked in the past.⁸ Now gold production began to increase in 1848, but prices did not begin to advance till 1852 or 1853. Here there exists a lag of about five years. Gold production reached a maximum in 1853 and then began to decline, yet prices did not turn till 1873 — a lag of about twenty years. In 1883 gold production reached a low, but prices continued to decline till 1896, indicating a lag at this transition point of about thirteen years. These are the only turning points in gold production and in prices in the whole period here considered, and there is no agreement at all among the three lags. Consequently it is not surprising that workers in this field have found some difficulty in agreeing on the length of the lag between changes in gold production and changes in the course of the price level.

A little thought, however, will make it apparent that the method of attack outlined above is quite unsound. In the first place the relation between gold production and prices is, as has been pointed out above, one with price trends and not with the actual values of the price index. And if the first transition point is used as an example, it is quite invalid to conclude that because gold production began to increase in 1848 while prices did not rise significantly till 1852, there exists a lag of four years. For it is still unknown to what extent this period of four years is true lag, and to what extent it is merely the depression phase of the particular cycle.

In the second place it is unwarranted to conclude that, since gold production reached low in 1883, for example, and in the next year began to increase, while prices did not reach wise called attention to the existence of lag and then failed to allow for it in his statistical work. Had he allowed for lag, in his study of the period 1878-1900, his results would probably not have been as spectacular as those he actually secured. (*Théorie Générale de la Monnaie*, 271-281.)

8. For a new and interesting study of the problem of lag see Kuznets, *Secular Movements in Production and Prices*, 251-254.

low till 1896, a lag of thirteen years is indicated. For obviously mere increase or decrease in annual gold production is not necessarily sufficient to cause a secular rise or fall in prices. The price level could not be expected to rise until the rate of increase of the world gold supply had become greater than the normal rate of increase. And, similarly, not until the rate at which the gold supply was increasing fell below the normal rate of increase, should prices have begun to fall. This makes the determination of the length of lag again appear to be easy, for the length of lag is the number of years between the time when the actual rate of increase of the gold supply rose above, or fell below, the normal rate of increase, and the time when the trend of the price level began to rise, or fall. Unfortunately, to determine the normal rate of increase by the Cassel method we must know what the length of lag is. Consequently the assumption that it is possible to determine what are "normal" quantities of gold for the base years is apparently quite invalid, for to determine the length of lag the Cassel method is forced to assume the normal rate of increase of gold as already known.

IV

The third assumption implicit in the Cassel method is that in the period studied the demand for gold was increasing at a constant rate. Probably the most important of the assumptions on which the method is based, it is also the most complex. This complexity is mainly due to the fact that the Cassel method deals with the problem of price trends in terms of gold and prices alone. Because of this, it is obvious, several assumptions must be made as to the elements other than gold and prices that are involved in the problem. The method assumes, first of all, that the volume of trade, and therefore the demand for means of payment, was increasing at a constant rate. In the second place, it assumes that there were no marked changes in policy regarding the monetary standard in the different countries. For even if trade, and therefore the demand for means of payment, was growing at a constant rate, the abandonment or adoption of the gold standard by an

important country must have meant that the demand for gold varied. In the third place, it is assumed that the rate of growth of the entire circulating medium varied as did the rate of growth of the gold supply.⁹ For obviously if variations in gold production were offset by variations in the rate of growth of non-gold currency in such a way that the circulating medium grew at the same rate as did trade, no trends in prices would have occurred, neither would the demand for gold have increased at a constant rate. Consequently if we bar compensating changes among these variables, for the occurrence of which there seems to be little evidence, it is apparent that the assumption that the demand for gold grew at a constant rate is valid only if these three further assumptions are supported by the facts.

The first of these three sub-assumptions — that the volume of trade, and therefore the demand for means of payment, was increasing at a constant rate — has been examined at some length by the writer, but with negative results. The problem is complex and the data which bear upon it are

9. That the second and third of these assumptions are implicit in the Cassel method was pointed out by Keynes in his criticism of it in 1911. (75 *Journal Royal Statistical Society* (1911), 46-47.) Keynes was wrong, however, in maintaining that the Cassel method assumes that the rates of increase of the gold supply and of the circulating medium have been the same. (*Ibid.*, 50.) As far as the logical validity of the Cassel method is concerned it would be quite possible for trade to be increasing at a rate of, say, 4 per cent, for the volume of means of payment to be increasing at a rate of 4 per cent, and yet for the gold supply to be increasing at a rate of only 3 per cent. The difference between the rates of growth of the gold supply and of the circulating medium, of which gold is only one constituent, could be explained by the progressive lowering of reserve ratios, the introduction of central banks and other devices enabling a larger volume of bank currency to be erected on the basis of a given amount of reserve than formerly, or it could be explained by progressive increase in the use of banks. As the use of banks increases, money is withdrawn from hand-to-hand circulation and deposited in banks where it becomes bank reserve, and on the basis of it a proportionally larger volume of bank currency can be erected, the exact amount depending on the reserve ratio policy of the particular system. It is obvious, therefore, that the Cassel method says nothing as to either the rate of growth of trade or the rate of growth of the circulating medium. It purports to tell us only the rate at which the demand for gold increased in the period being studied.

meagre. The assumption is, however, not at all a violent one, and for the purposes of this study will be considered as being reasonably valid.

As is commonly known, the second of these three sub-assumptions — that there were in the period 1850–1910 no marked changes in standard policy — is not at all borne out by the facts. The abandonment of the gold standard by the United States in 1861, and the adoption of the gold standard by Germany and the return to gold by the United States in the seventies, at just the time when these two countries were beginning their phenomenal industrial and commercial expansion, were probably the three most important changes in standard policy in this period. The abandonment of bimetallism by the countries of the Latin Union, and the adoption of the gold standard by Holland, Norway, Sweden, and Denmark were other important events which occurred in the decade of the seventies. Japan returned to the gold standard in 1886, Austria adopted the gold standard in the period 1892–1896, and Russia in 1895. In the period 1861–1896, consequently, changes in standard policy were so many and so important that it would seem hard to defend the assumption that in the period 1850–1910 the demand for gold was constant. Trade, and therefore the demand for means of payment, may have grown at a constant rate, but this can hardly be said of the demand for gold.¹

The problem of the third sub-assumption — that the rate of growth of the circulating medium has varied as has the rate of growth of the gold supply — is especially interesting, because it is made not only by the Cassel method but in large

1. In connection with his comparison of the actual price level with his computed secular price level Cassel did consider the problem of changes in standard policy, and concluded that, altho the effects of these changes have in general been overestimated, the discrepancy between the two price levels "cannot very well be explained otherwise than by assuming that the gold-demand increased a little more slowly before 1870 and a little more rapidly afterwards," a supposition which "seems natural in view of the great changes in the province of standard policy which characterize the seventies." (Social Economy, 468, 470.) This he says quite regardless of the fact that it is partly on the validity of the assumption of a constant rate of increase in the demand for gold that the validity of his 3 per cent estimate depends.

part by all studies of the problem of price trends. None of these studies considers in any comprehensive way the problem of the relation that has existed in the past between the growth of the gold supply and the growth of the entire vol-

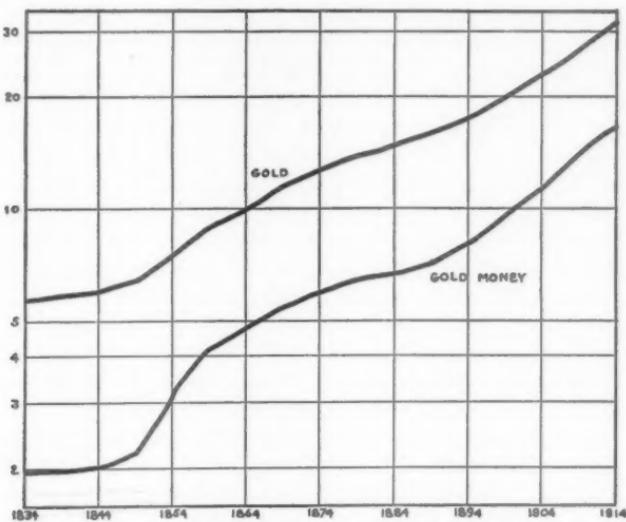


CHART 3. WORLD GOLD AND GOLD MONEY STOCKS
(hundred-million pounds)

Source: Royal Commission on Indian Currency and Finance,
3 Report (1926), 534

ume of means of payment. All have worked in terms of gold and prices alone.² Yet it is obvious that this is valid only if the rate of growth of the circulating medium has varied as has the rate of growth of the gold supply. Such statistics as are available will now be analyzed in an attempt to ascertain the validity of the assumption.

Variations in gold production in the nineteenth century and in the first part of the twentieth century were marked,

2. See, for example, Layton, *Introduction to the Study of Prices*; Aupetit, *Théorie Générale de la Monnaie*, 271-281; and Kuznets, *Secular Variations in Production and Prices*, 251-257.

and consequently variations in the rate of growth of the gold supply, secured by cumulating annual production, were appreciable. (Chart 3.) When these data are plotted to ratio scale, breaks in trend occur at, roughly, 1849, 1859,³ and 1890, the rate of growth in the periods 1849-1859 and 1890-1913 being, of course, greater than in the period 1859-1890. Now if the rate of growth of the circulating medium has varied as has the rate of growth of the gold supply, it is apparent that the money in hand-to-hand circulation and the bank notes and deposits curves should show similar conformation. Their slopes, or rates of growth, would probably not be the same;⁴ but if there has been that correlation between variations in gold production and the other constituents of the circulating medium that is assumed to have existed, then the money in hand-to-hand circulation, bank reserves, and bank currency curves, when plotted to ratio scale, should show breaks in trend at about 1849, 1859, and 1890, as the gold supply curve does. When gold production has increased, their rates of growth should have increased, and when gold production has declined their rates of growth should have declined too.

To be of use for our purpose it is obvious that the statistics must at least bridge transition points in gold production or in prices. Statistics which cover the period 1896-1913, for

3. It is not at all easy to place this second transition point, because the decline in gold production after the maximum in 1853 was gradual. Consequently there was no marked break in trend in the rate of growth of the gold supply in this period of declining gold production.

4. Not all the gold, or even a constant proportion of it, was coined. (See Kitchin's statistics, Royal Commission on Indian Currency and Finance, 3 Report, 534.) Moreover, in some countries, notably the United States, silver and paper have been important forms of money in hand-to-hand circulation and in bank reserves, and there is no reason why the coinage of silver, under the conditions that prevailed in this period, or the issue of paper should have varied as did gold production. For these reasons it would be sheer coincidence if the standard money supply had grown at the same rate as the gold supply. Because the substitution of deposit currency for money involves the transfer of money from hand-to-hand circulation to bank reserves, money in hand-to-hand circulation should have grown at a slower rate than the standard money supply, while bank reserves should have grown at a faster rate. And in those cases in which reserve ratios have fallen, bank currency would, of course, show a more rapid rate of increase than bank reserves.

example, would be of little value, since they would be confined to a period in which gold production was increasing and in which prices were rising. This requirement, of course, limits the data which are available, but enough remain to be worth analyzing.

Because the statistical data necessary for its solution are in large part lacking, the problem of the conformation of the money in hand-to-hand circulation curve is rather quickly disposed of. That variations in gold production should have caused variations in the rate of growth of the gold money supply is of course to be expected, and Kitchin's statistics of the world gold money supply show that his occurred. (Chart 3.) Moreover, study of coinage statistics would seem to indicate that there has existed a fair degree of correlation between variations in gold production and variations in the growth of the standard money supply, tho in the case of some countries this correlation can hardly be called striking.⁵ But there are no statistics available on which to base an estimate of the growth of the amount of money in hand-to-hand circulation in any country other than the United States, and even in the case of this country the statistics leave much to be desired. For the United States there are available reasonably adequate statistics of money outside the Treasury, but the statistics of cash holdings of all commercial banks are not a homogeneous series.⁶ Consequently our estimate of money

5. Especially noticeable is the failure of English coinage statistics to increase as significantly after 1849 as it would be reasonable to expect, and equally striking is the failure of German coinage statistics to increase after 1889. The estimate of world gold plus silver coinage of the United States Treasury Department for the years 1873-1913 (*Information Respecting United States Bonds, Paper Currency and Coin, Production of the Precious Metals, Etc.* (1915), 81) also shows no increase after 1897.

It is, of course, obvious that as indexes of the growth of the standard money supply, coinage statistics have significant failings. They omit standard paper money, which during the period being studied was an important constituent of the circulating medium in some countries, they do not include the value of gold bars which have gone into monetary use, and they include coin which has been withdrawn from circulation for recoinage.

6. Statistics of the cash holdings of national banks are available from 1867, of state banks from 1873, of trust companies from 1875, and of

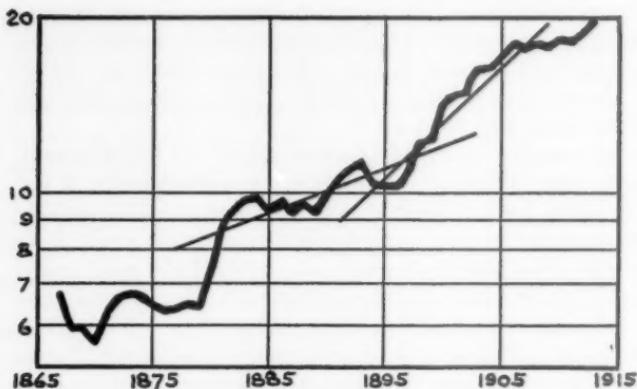


CHART 4. UNITED STATES—MONEY IN HAND-TO-HAND CIRCULATION (hundred-million dollars)

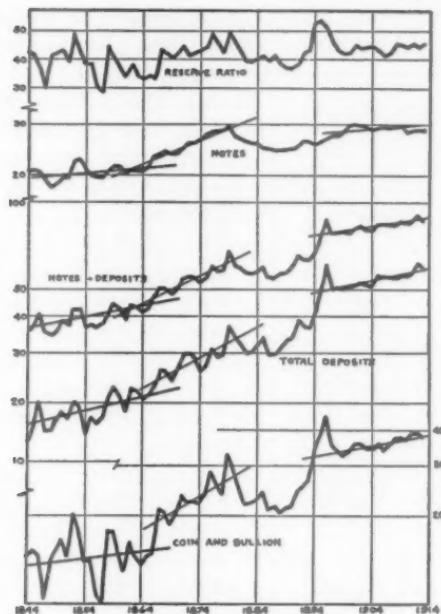
Sources: Statistics for Money-outside-Treasury taken from Report Secretary Treasury on State Finances, 1928, 550-551. Statistics for Money-in-Commercial Banks for 1867-1909 taken from National Monetary Commission, Statistics for the United States, 33. For 1910-1913, Report Comptroller Currency, 1913, 774, 775, 777, 778 and A. A. Young, Analysis of National Bank Statistics, 12-13. Reports nearest June 30.

in hand-to-hand circulation is not at all accurate for the years before 1896. Such as it is, it correlates in a rather marked degree with variations in gold production.⁷ (Chart 4.)

The increase of bank currency and its correlation with various private banks not until 1887. Moreover, the statistics of cash holdings of state and private banks and trust companies for the years 1886-1895 inclusive include "cash items." Consequently the statistics of money in hand-to-hand circulation for the years 1886-1895 inclusive (Chart 4) are lower than they would be if cash items were excluded. (This is because the statistics of money in hand-to-hand circulation were secured by subtracting money in bank reserves from money outside the Treasury.)

Since in this country the notes of national banks are more in the nature of money than of bank currency, they are here counted as money, and their behavior is not considered in the discussion of the bank statistics of the United States.

7. The break in trend which occurs at about 1895 would be even more pronounced if accurate statistics of the cash holdings of commercial banks were available for the years 1886-1895. Failure of money in hand-to-hand circulation to increase in the period before 1879 was, of course, because of deflation following the Civil War.

CHART 5. BANK OF ENGLAND
(million pounds)

Sources: 1844-1909, National Monetary Commission, Statistics for Great Britain, Germany, and France, 79-83. 1910-1913, 62 Statistical Abstract United Kingdom (1900-1914), 368-369.

ations in gold production will be investigated for different countries separately. Altho, for the present purpose, largely of incidental interest, the growth of bank reserves and their relation with variations in gold production, and the course of reserve ratios, will be examined too.

Study of the returns of the Bank of England shows that the statistics of coin and bullion (total in Issue and Banking Departments combined), notes held by the public, total deposits, and notes held by the public plus total deposits, when plotted to ratio scale, exhibit four rather well-defined periods of trend or lack of trend. (Chart 5.) The first of

these extends from 1844 to about 1866. The second begins at about 1866 and ends at about 1880. The third period is a decided slump in the curves with no definite trend. Beginning about 1880 the three items, reserve, notes, and deposits, fell away sharply, reached low in the period 1886-1888, and then rose rapidly. The fourth period begins at about 1894 and ends in 1913. But of the three breaks in trend, 1866, 1880, and 1894, only the last one coincides even roughly with a break in trend of gold production or of prices.

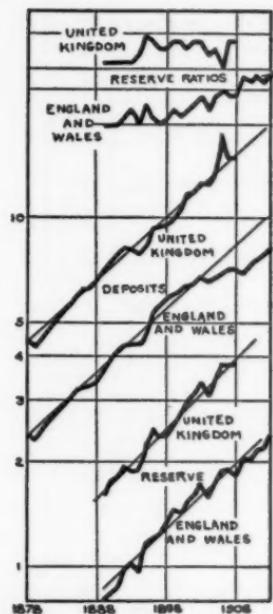


CHART 6.
BRITISH JOINT-STOCK BANKS
(hundred-million pounds)

Sources: 1878-1908, National Monetary Commission, Statistics for Great Britain, Germany, and France, 27, 30-35. 1909-1913, 82 Economist (1916), 906.

evident.⁸ Furthermore it is apparent that after 1866, when

8. English coinage statistics also failed to show any significant increase after 1849.

In his discussion of the effects of the Californian and Australian gold discoveries, Layton tries to make it appear that there did occur an upheaval in the affairs of the Bank of England at this time. Phrasing his discussion in terms of the traditional reasoning as to the way in which

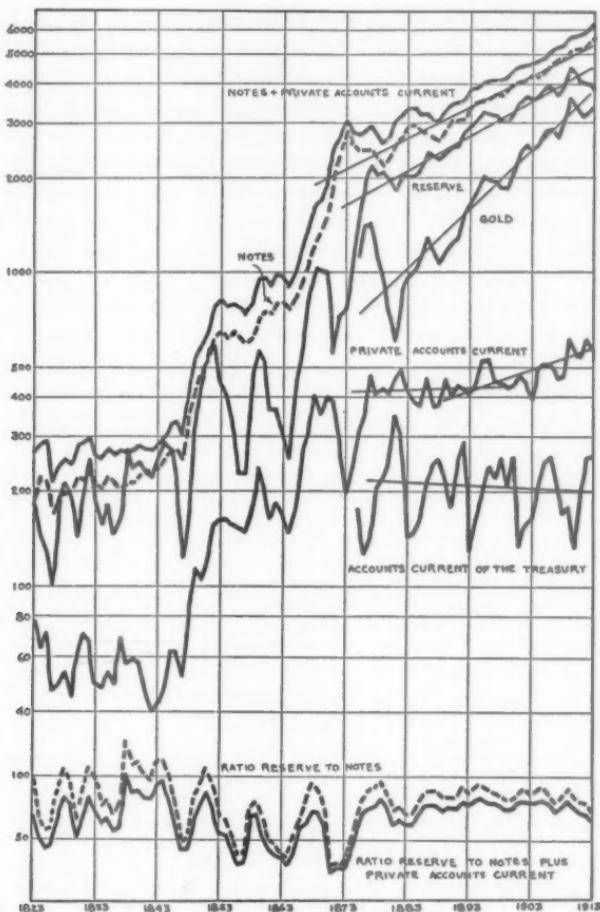


CHART 7. BANK OF FRANCE
(million francs)

Sources: Statistics for gold holdings and accounts current of the treasury for the period 1875-1880, National Monetary Commission, Statistics for Great Britain, Germany, and France, 293. All other statistics taken from 35 Annuaire Statistique de la France (1916-1918), 70-82.

gold production had begun to fall off appreciably, the Bank of England's reserve and the notes and deposits based upon it began to grow much more rapidly than they had grown when gold production was booming. And it is also evident that after 1896, when gold production was undergoing a marked and sustained increase which was far more significant than the large but abrupt and short-lived increase after 1849, the reserve grew at a much slower rate than in the period 1866-1880 when gold production was declining. The same is true of notes and deposits. Certainly on *a priori* grounds better correlation of Bank returns with gold production and with price trends was to be expected.⁹

gold discoveries result in a rise in prices, as advanced by Marshall before the Gold and Silver Commission in 1887, Layton says, "The gold at the outset found its way to the Bank of England, whose total holding of bullion rose from £10,428,000 in 1847 to £20,587,000 in 1852, the increase being accompanied by a fall in the rate of discount to £2:3s. per cent. But it soon passed on into circulation, . . ." (Prices, 46.) Study of the returns of the Bank shows, however, that Layton's description of the behavior of Bank of England reserve is misleading. According to him the reserve almost doubled in the short space of five years. This to be sure did occur, but it should be noted that in 1847 the reserve was, as a result of the panic of that year, very low, when compared with the years immediately before and after, and that 1852 was an equally isolated high spot, the reserve falling precipitously thereafter to a level in 1857 which was lower than the low of 1847. (Chart 5.) To deal in isolated highs and lows as Layton has done, rather than in terms of trend, can give only a distorted picture of the course of events. Only a slight increase in reserve in the period 1847-1853 is shown by our trend line. (Chart 5.)

9. The striking decline in reserve, notes, and deposits in the period from about 1880 to about 1894 is quite unlike anything met elsewhere in this study. London clearings, when deflated by the Sauerbeck index, show no such break; and as is shown below, the deposits of the joint-stock banks of the United Kingdom grew at a constant rate throughout this period. Examination of the securities item of the Banking Department shows that while total securities showed some tendency to run below the line of trend in these years, the curve shows no such drastic fall as do those of reserve, notes, and deposits. Study of gold-flow statistics shows that in the period 1877-1888 inclusive England lost gold on balance. Six of these years, to be sure, showed net imports, but except for 1878 the amounts were small. The decline in the reserve of the Bank of England in the period 1879-1881 inclusive was due to a drain abroad, but the decline in reserve in the period 1882-1888 was apparently caused by an internal drain, for in these years England gained 4.3 million pounds on balance while Bank of England reserve fell 1.2 million pounds.

Statistics of the deposits of the joint-stock banks of England and Wales, and of the whole of the United Kingdom, including the colonial and the foreign banks, are available from 1877, but statistics of reserve (cash, money at call, at short notice, and at central bank) are available only from 1889.¹ Study of the statistics of deposits (Chart 6) shows a straight-line trend in the case of all banks, and in the case of the banks of England and Wales a straight-line trend till 1901 or 1902, when the rate of growth of deposits began to decline. For the brief period for which statistics are available, reserves of the joint-stock banks of the United Kingdom grew at a rate which was both constant and of about the same magnitude as the rate of growth of deposits of these banks. Consequently the reserve ratio showed little change. Reserves of the joint-stock banks of England and Wales grew at a constant rate, and the reserve ratio tended to rise. The decline after 1901-1902 in the rate of growth of deposits of these banks was apparently not due to any shortage of reserve.

The only French banking statistics that are available in continuous form for any length of time are those of the Bank of France. Unfortunately, even these are of little worth for

1. The statistics of the private banks have not been included, as they are available only from 1892 on. From 1892 the volume of private bank deposits decreased steadily, due mainly to amalgamation with the joint-stock banks. The effect of their omission upon the course of bank deposits figures, which have been plotted to ratio scale, has obviously been to give the curve a steeper slope than it should have. This is because in the early period, when the private banks were an important element in the British banking system, their deposits were not included in the grand total, while in the later part of the period they were included in the deposits of the joint-stock banks with which the private banks were for the most part merged. Another factor which would tend to have the same effect is the incomplete nature of the returns in the early years. It is impossible to measure the effect which these omissions have on the curves which are here presented, but they should be borne in mind in interpreting the data. In October 1892, the deposits of the private banks amounted to 16.3 per cent of the deposits of the joint-stock banks of England and Wales, and to 8.8 per cent of the deposits of the joint-stock banks of the entire United Kingdom. (National Monetary Commission, Statistics for Great Britain, Germany, and France, 27.)

our purposes for the years before and after 1849, the first major transition point in gold production and prices, because of the fact that in the year 1848 the government merged the nine then-existing independent banks of issue with the Bank of France. The marked increase occurring at this time in the items of the Bank of France which have been plotted for study (Chart 7) is therefore doubtless due in the main to non-homogeneity of the data. The problem is further complicated by the suspension of specie payments in the period 1848-1850.

From about 1848 to about 1873, reserve, notes, and private deposits grew rapidly, at rates which varied considerably. This period corresponds to the period 1849-1873, in which the trend of prices was upwards. But since gold production was slowly declining in the period 1853-1883, the rates of growth of reserve, notes, and private deposits seem to show little correlation with gold production. In this period these items showed their most rapid growth.

From about 1875 to 1913 there exist well-defined trends in the reserve and gold-holdings items, both of which grew at constant rates. Accounts current of the Treasury, statistics of which do not become available till 1875, show marked fluctuations and a slightly declining trend. Private accounts current show a break in trend at about 1896 such as would seem reasonable to expect, and the notes also show some tendency to break in trend in the early nineties. But despite variations in gold production, no change in the rate of growth of reserve or of gold holdings is apparent in these years. The fact that in this period the rate of growth of the gold holdings of the Bank was more rapid than the rate of growth of the reserve is indicative of the gradual improvement in the gold-silver ratio of the Bank of France, which, as is commonly known, was being effected in these years. But apparently this improvement occurred at as rapid a rate before 1890 as afterwards.²

2. Keynes' statement that in the period 1900-1914 central banks showed a tendency to hoard all gold that flowed their way, thereby improving their reserve ratios, and that their action in so doing tended

Coin reserve of the Bank of Germany³ increased at a rapid rate in the period from 1876 to about 1895. (Chart 8.) There then followed a period of thirteen years of no advance, the level of 1895 not being again attained till 1908. From about 1908 to 1913 the rate of growth was again rapid. Only in this last period does there appear to have been any significant correlation between the rate of growth of coin reserve and gold production. Notes in circulation show a trend which was roughly straight-line throughout the period 1876-1913. Some decline in the rate of growth at about 1900, and a more rapid rate of growth thereafter are apparent. Other demand liabilities show a downward trend from 1876 to 1881-1883, a steep upward trend from 1881-1882 to 1892, and an upward but much less steep trend in the period from 1892 to 1913. The trend of total demand liabilities (notes plus current accounts) was only very roughly straight-line. There was rapid growth to about 1890, then a slower rate of growth to about 1904, to make the rise in prices which occurred after 1896 less pronounced than it would otherwise have been (Monetary Reform (Harcourt Brace edition), 88-89) is apparently not borne out by the facts; for in the statistics of the Bank of France there is no suggestion of the reserve or gold-holdings increasing at any faster rate after 1900 than before. And study of the course of the ratio of reserve to notes and the ratio of reserve to notes plus private accounts current shows that the trend of these ratios after 1900 was, if anything, slightly downwards. Neither did there occur any significant improvement in the reserve ratio of the Bank of England after 1900, and the decline in the reserve ratio of the Bank of Germany after 1895 was striking. (Charts 5 and 8.) Because the gold holdings of the Bank of France grew more rapidly than the reserve, the ratio of gold to notes plus private deposits improved, but the ratio of coin to notes plus private deposits did not.

The statistics of the commercial banks of France are especially meagre. Apparently all that exist in comprehensive form are the returns of the more important banks for the years 1888-1907 which were collected by the National Monetary Commission, and even these are in many cases incomplete. (Statistics for Great Britain, Germany, and France, 317-337.) From these data the reserve (cash plus balances at Bank of France) and the deposits plus current accounts items have been compiled, but study of the figures shows nothing conclusive. The period for which they are available is too short.

3. Legal reserve of the Bank of Germany in this period included imperial treasury notes, but as these never formed any considerable part

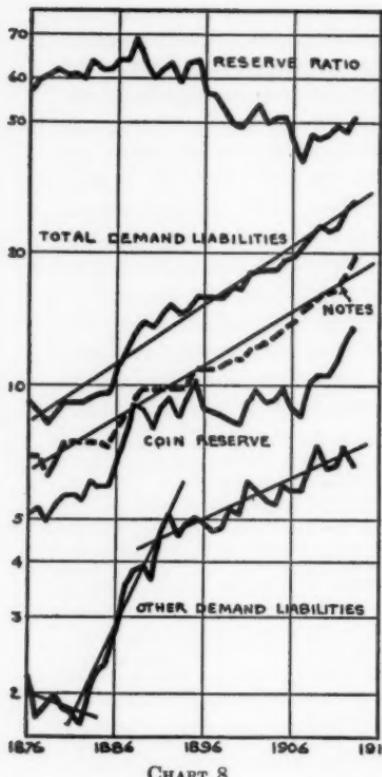


CHART 8

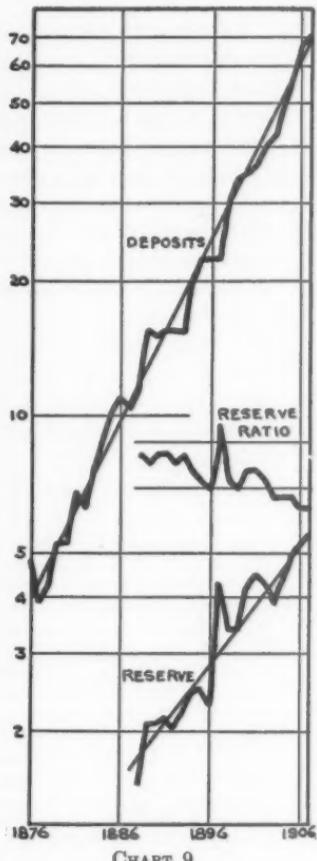


CHART 9

CHART 8. BANK OF GERMANY
(hundred-million marks)

Sources: 1876-1907, National Monetary Commission, Statistics for Great Britain, Germany, and France, 173. 1908-1913, Statistisches Jahrbuch für das Deutsche Reich.

CHART 9. GERMAN JOINT-STOCK BANKS
(hundred-million marks)

Source: National Monetary Commission, Statistics for Great Britain, Germany, and France, 202, 214.

followed by a second period of rapid growth. The decline in the ratio of coin reserve to total demand liabilities after 1895 was marked.⁴

Users of the statistics of deposits and current accounts of the German joint-stock banks are warned by the compilers that the statistics "can make no claim of completeness for the years before 1889."⁵ Such as the data are, they show a rate of growth that was so constant throughout the period covered as to be striking. (Chart 9.) No correlation with gold production or with price trends is discoverable. Reserve, statistics for which are not available until 1888, shows a trend which, tho broken, is roughly straight-line. The reserve ratio fell.

Examination of the chart on which the combined gold holdings of the three great central banks have been plotted (Chart 10) shows that the rate of growth was, if anything, higher before 1896 than afterwards. There is no evidence that the increase in world gold production, which had become pronounced by the early nineties, had any effect on the rate of growth of the gold holdings of these three banks. If the coin reserve items of the three banks are combined, the same general picture is obtained. The slower rate of growth of the coin reserve as compared with the gold holdings is indicative of the gradual improvement in the gold-silver ratio which was being effected by the central banks of France and of Germany. But if the returns of these banks are combined, it is seen that this improvement in the gold-silver ratio, inter-
of the reserve, they have been omitted from consideration in the discussion that follows.

4. Returns of all the German banks of issue are available for the period 1875-1913. These show in general the same characteristics as do those of the Reichsbank, the only significant difference being the more rapid rate of growth of the items of the Bank of Germany than of all banks of issue. Since the Bank of Germany was so large as to dominate the other banks, and strengthened its position as the years passed (because of the gradual abandonment of the right of issue by the state banks and the assumption of this right by the Bank of Germany), these results are, of course, only to be expected.

5. National Monetary Commission, Statistics for Great Britain, Germany, and France, 202.

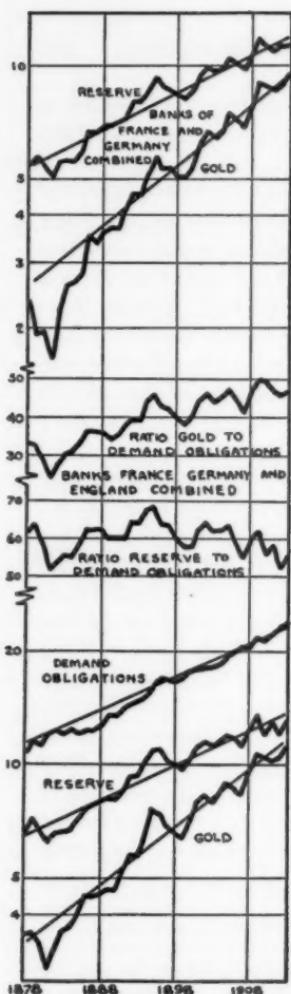


CHART 10

CHART 10. BANKS OF ENGLAND, FRANCE, AND GERMANY COMBINED
(hundred-million dollars)

Sources: Coin Reserve and Demand Obligations, as given under Charts 5, 7, and 8, converted to dollars at the rates of 1 pound to 5 dollars, 5 francs to 1 dollar, and 4 marks to 1 dollar. Gold Holdings, 1878-1909, National Monetary Commission, Statistics for the United States, 282. Gold Holdings, 1910-1913, England, as given under Chart 5 reduced by 800,000, this being an estimate of the amount of silver held by the Bank of England in this period. (See Statistics for the United States, 282, footnote b.) France, as given under Chart 7. Germany, Statistisches Jahrbuch. For the period 1910-1913 the amounts have been converted to dollars at the ratios used above.

CHART 11. COMMERCIAL BANKS OF THE UNITED STATES
(hundred-million dollars)

Sources: 1867-1909, National Monetary Commission, Statistics for the United States, 31, 33, 34. 1910-1913, Report Comptroller Currency, 1913, 774, 775, 777, 778 and A. A. Young, Analysis National Bank Statistics, 12-13. Reports nearest June 30.

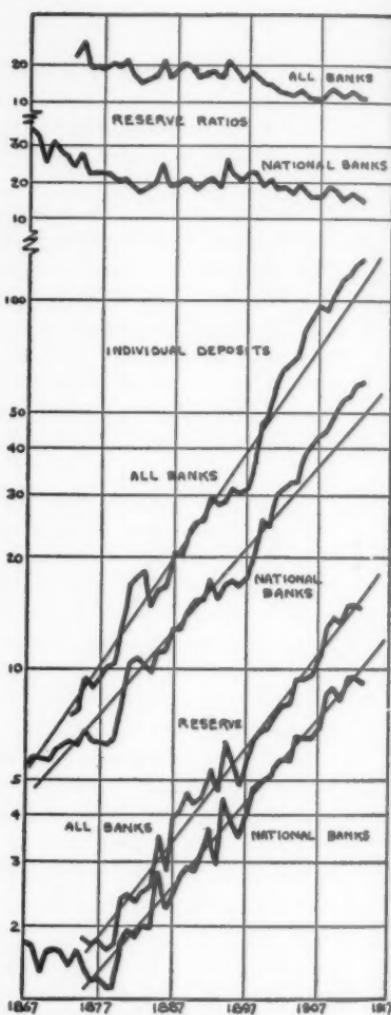


CHART 11

estingly enough, went on at a more rapid rate before 1896 than after. (Chart 10.) While the demand obligations of the three banks combined slumped below the line of trend in the period from about 1883 to about 1894, study of the reserve and gold holdings curves shows that this decline in demand obligations was not due to any slackening in the rate of growth of reserves in this period. Nor was there any increase in the rate of growth of total demand obligations of the three banks after 1896. The ratio of coin reserve to demand obligations of the three banks combined tended to rise in the period before (roughly) 1896, and to fall thereafter. The ratio of gold holdings to demand obligations improved, but apparently the improvement was more rapid before 1896 than later.

Study of the cash holdings of national banks and of all commercial banks of the United States shows that they both increased at a rate which was remarkably constant.⁶ (Chart 11.) The figures for all banks in the period 1887-1895 lie above the trend line, but this is because cash items were included in the returns of other than national banks during that period. While the course of bank reserves was more erratic before 1896 than after, the increase in gold production

6. The more complete than for any other country, the commercial bank statistics of the United States leave much to be desired. The statistics of national banks are complete from the organization of the system, but the statistics of all commercial banks are not homogeneous series, statistics of state banks first becoming available in 1873, of trust companies in 1875, and of private banks in continuous form only from 1887. Statistics of deposits of private banks, but not of their reserves, are available for the years 1878-1883 inclusive, and have been included in the statistics of deposits which have been plotted for study here. That the returns of private banks do not become available in continuous form until 1887 is regrettable, for in the early years the private banks were not at all unimportant, their deposits in 1878 amounting to 21.9 per cent of the individual deposits of national and state banks and trust companies in that year. (National Monetary Commission, Statistics for the United States, 31.)

Other defects are the inclusion of cash items in the statistics of reserve of other than national banks in the period 1886-1887 to 1895, the inclusion of savings deposits in the statistics of deposits of other than national banks, and the inclusion of time deposits in the statistics of deposits of both national and non-national banks. The statistics of reserve of other than national banks were corrected for cash items for the years 1890-1895 by Mitchell; and, largely on the basis of an analysis of individual

apparently had no effect on their rate of growth, for no break in trend occurred.⁷

Study of the statistics of individual deposits of national and of all commercial banks shows that in each case there are two exceptions to a straight-line trend. These are the marked slump below the line of trend in the nineties and the tendency of the curves to run above the line of trend from about 1900 on. It is evident, however, that these deviations were not due to any change in the rate of growth of reserves; for, as has just been shown, reserves grew throughout the period at rates that were remarkably constant. The decline in deposits in the nineties was doubtless because of the decline in economic activity which practically all American indices of trade and production show for that troubled period; and the rise of deposits to a new and higher level after 1900 was because of the fall in reserve ratios which occurred at this time. Study of the ratios of cash holdings to individual deposits of the different classes of banks shows in all cases except trust com-

deposits into their various components for the years 1896, 1899, 1906, and 1909 by the National Monetary Commission, an estimate of demand deposits was made by Mitchell for the years 1890-1911. (National Monetary Commission, Statistics for the United States, 151. Mitchell, Business Cycles (1913), 300-306, 311-322. See also Fisher, Purchasing Power of Money (1913), 281, 304, 434-441.) Since these estimates extend only six years back of 1896, the year in which the trend of prices changed, they are of little value for the purpose of this study. And because no data are available on the basis of which the statistics can be corrected for time and savings deposits in the years before 1890, the uncorrected statistics, as given in the official sources, are used here.

7. This would seem to indicate that the correlation noted by Burgess between the gold stock of the country and demand deposits in the period 1880-1915 (*Reserve Banks and the Money Market*, 241-243) is spurious. Since there was no secular decline in reserves in the nineties, there would seem to be no reason, as far as the reserve position of the banks was concerned, why deposits should have declined in this period, nor why they should have risen after 1900. In my opinion it is the failure on the part of studies such as that of Burgess to take into consideration more than two of the variables involved in the problem that is at the root of many of our troubles in this complex problem of price trends. Had Burgess investigated the relations that existed between the course of the gold stock of the country and the growth of bank reserves, and the growth of bank reserves and of bank deposits, his results would have been less convincing than those he obtained.

panies a steady decline in this ratio, which became pronounced in the years immediately after 1900.⁸

The conclusion of this analysis of bank statistics is that such data as are available show that little or no relation existed between the rate of growth of the gold supply and the rate of growth of either bank reserves or bank notes and deposits. Between variations in gold production and variations in the rate of growth of the most important part of the circulating medium there seems to have been almost none of the correlation that is assumed by all studies of the problem of price trends that deal in terms of gold and prices alone. This absence of correlation is especially striking in the period from about 1875 to 1913, when so many of the statistics examined show a relatively constant rate of growth of bank reserves and of bank currency, quite unaffected by variations in gold production or by trends in prices.

V

The results of this study have been in the main negative. Examination of the first assumption implicit in the Cassel method showed that, while it is probably quite valid on theoretical grounds to assume that two different years can be chosen in which prices stood at the same level, the problem is not at all simple in actual practice. Furthermore, the base years chosen by Cassel are hard to defend. The second

8. For the statistics of reserve ratios of the different classes of banks for the years 1867-1909 see National Monetary Commission, Statistics for the United States, 34. For the years after 1909 see the reports of the Comptroller of the Currency, especially those for 1909, pp. 196-198, and 1914, pp. 190-193. The inclusion of cash items in the statistics of cash holdings of other than national banks in the period from 1886-1887 to 1895 means that the ratios of cash holdings to deposits of state and private banks and trust companies were higher in these years than they would be if cash items were excluded. Consequently the decline in the cash holdings-deposits ratio of all commercial banks after 1896 appears to be greater than it actually was.

Total deposits of national banks rose to a higher level after about 1900 than did individual deposits, but aside from this difference the curves of total deposits of national and of all commercial banks show almost identically the same slopes and conformation as do the curves of individual deposits of these banks. As they show little that is new, they are not presented here.

assumption, that it is possible to determine what quantities of gold are "normal" for the base years chosen, was found to be probably invalid, being bound up with the apparently unsolvable problem of lag. And study of the third assumption, that the demand for gold has been increasing at a constant rate, yielded equally negative results. Of the three further assumptions into which this third assumption can be resolved — that the rate of growth of trade has been constant, that there have occurred no violent changes in standard policy, and that the rate of growth of the circulating medium has varied as has the rate of growth of the gold supply — the first, altho reasonable, can apparently be little more than an assumption; the second is admittedly invalid; and analysis of such bank statistics as are available shows that the third is not supported by the facts. Evidently the rate at which the demand for gold increased was not at all constant. Indeed, it seems reasonable to believe that it varied within wide limits.

In the face of these difficulties, it is hard to believe that the Cassel method of computing the normal rate of increase of gold has much validity. The problem is complex, and in it gold and wholesale commodity prices are only two of many important variables. Examination of the available statistics and indexes of population, production, trade, may give us some idea of what the rate of increase in the demand for *means of payment* has been in the past, and study of monetary and banking statistics may in turn give us some idea of what the rate of increase in the demand for gold has been. On the basis of these, a tentative forecast may be made for the future.⁹ At best, however, these will be rough estimates subject to a large margin of error. Precision of statement is wholly unwarranted.

9. Perhaps the best example of the use of this "direct" method of attack upon this problem of the normal rate of increase in the demand for gold is Lehfeldt's study. (Gold, Prices, and the Witwatersrand, 23-33.) After examining the rates of increase of several important economic magnitudes — population, production of the important staples, ship tonnage, railway mileage, etc. — over the last fifty years or so, Lehfeldt concluded, "We cannot go much beyond saying that the true

rate lies between 2 and 4 per cent, and is therefore not very different from 3 per cent." (Ibid., 32. "Rate" refers to rate of increase of trade.) Because of the spread of banking and the introduction of substitutes for money, the rate of growth of the demand for gold money has undoubtedly increased more slowly, and may be estimated at about 2½ per cent. (Ibid., 32-33.)

In this connection Keynes' recent discussion of the Cassel 3 per cent estimate is of interest. "For the output of raw materials and the volume of trade which get into the statistics, it seems about right. But it may be much too high if we include the vastly greater volume of unrecorded activities. The population of the world is increasing by about 1 per cent. Surely it is not plausible to maintain that the average standard of life of the human race, including Asia and Africa, is rising at the rate of 2 per cent cumulative. On the other hand, it is the statistically recorded activities which are most relevant to the demand for money." (Treatise on Money, II, 296 note.)

J. T. PHINNEY.

HARVARD UNIVERSITY.

TAX SHIFTING AND THE LAWS OF COST SUMMARY

Introduction, 680. — I. Marshall's treatment examined, 681. — II. Doubts as to its usefulness: (1) the assumption of free competition, 685; independence of the cost of labor and capital, 690; effect of public expenditures, 695; the assumption that an industry obeys one law of cost throughout, 698; "boxing" an industry, 701. — III. The "statistical" method of analyzing tax-price relationships, 703. — The "theoretical-statistical" method more promising, 706.

Since the time of Nassau Senior a considerable number of English and American writers have used the laws of cost in their analysis of the effect of a per unit or specific tax on a commodity produced under competitive conditions.¹ The result has been the establishment and general, tho not universal, acceptance by fiscal authorities in England and the United States of the following conclusions: that the effect of a tax on each unit of product of an industry which is subject to the law of increasing cost will be an increase in the price of the product by something less than the amount of the tax; an increase in price by an amount equal to the tax if the industry is subject to the law of constant cost; and an increase in price by an amount greater than the tax in the case of industries operating under the law of decreasing cost. There exist, however, among the writers who accept these conclusions marked differences in the definitions of the laws of cost and in the reasoning by which the conclusions are established.

Probably the most widely known and most influential exposition of the problem is that of the late Alfred Marshall. In general, there have been only minor disagreements with the Marshallian analysis by writers who have approached the problem of specific tax shifting through the laws of cost.²

1. I have reference, of course, to the effect on price of a specific tax levied either exclusively or unequally upon a given commodity.

2. Professor Bullock's treatment of the problem does present, however, sharp contrasts with Marshall's analysis and, in the case of decreasing cost, with Marshall's conclusion. Professor Bullock's discussion is given in his article "The Variation of Productive Forces," *Quarterly Journal of Economics*, vol. xvi, August, 1902, pp. 509-513.

An examination of the validity of the conclusions reached by Professor Marshall will constitute one of the minor objectives of this paper. This will be followed by an evaluation of the practical significance of such of the Marshallian generalizations as may be found to be valid. It is in this appraisal that our major objective lies. And, finally, the writer will venture certain suggestions designed to make the theory of specific tax shifting a better guide to fiscal policy.

I

Marshall's treatment of the effect of a specific tax on price is given in connection with his discussion of changes of normal demand and supply in relation to the doctrine of maximum satisfaction. He is dealing with a particular phase of long-period normal price, and is thinking in terms of the long-run or ultimate economic effects of economic forces. He is assuming a period of time sufficiently long to enable economic forces "to work out their full effect." He assumes further that the forces of demand and supply have free play; and that through "much free competition" there is established only one price in the same market at one and the same time.³ Another assumption essential to his argument is that the imposition of a specific tax causes no change in the demand schedule. In short, in order to determine the effect of the tax, other things are assumed to be equal. He does not, of course, deny the existence of other tendencies, "but their disturbing effect is neglected for a time." In studying the influences exerted by the element of time, he rejects the fiction of a stationary state, and as a concession to realism adopts the "statical" method.⁴ And finally there is the assumption "that the commodity obeys the law of diminishing return or obeys the law of increasing return throughout."⁵

3. Alfred Marshall, *Principles of Economics*, 8th ed., p. 341.

4. For a statement of the features of the "statical" method see Marshall, *Principles*, 8th ed., pp. 368, 369.

5. While Marshall, in many instances, deliberately makes significant modifications in his assumptions in an effort to get at truth, there is no evidence of this procedure in his discussion of the effect of a specific tax on price.

Fig. 3

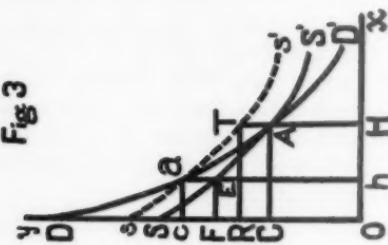


Fig. 2

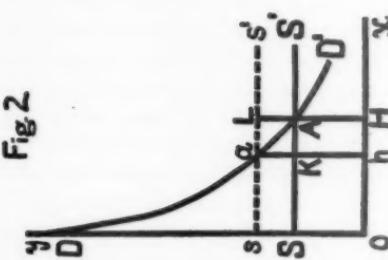
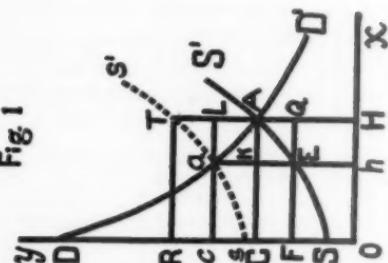


Fig. 1



Keeping in mind Marshall's assumptions, let us test the validity of his conclusions concerning the effect of a specific tax on price.

Figures 1, 2 and 3 are reproductions of the diagrams by which he increased the clarity of his argument. In each figure the curve SS' represents, of course, the long-run supply schedule. But here we meet an important and difficult question. What is the nature of Marshall's long-run supply schedule? Is it merely an *hypothetical* price series indicating the amount or flow of goods (allowance being made for the adjustment of an industry to each several scale of production) that will be forthcoming at each several price? Or does the curve indicate the historical course of marginal cost of production in response to an increase or increases in demand in the schedule sense?

If the former is the case, such a curve is coördinate with Marshall's normal demand curve, which is merely an hypothetical price series indicating the amount of goods which will be taken at each several price. Neither curve is historical. Both are independent of time in an historical sense.⁶ Marshall is not reversing an historical process when his demand schedule is shifted to the left. DD' can be thought of as the only one of a continuous series of possible demand curves intersecting SS' at every point which he has chosen to represent in his diagram. It is independent of time in an historical sense,

6. We know, of course, that according to Marshall each several supply price must be sufficient to cover the cost (marginal in the case of industries of increasing and constant cost, and cost to the representative firm in industries of decreasing cost) corresponding to each several rate of production. We know also that increasing cost is, according to Marshall, the result of a decreasing return in physical products from the application of additional and equal units of a factor of production or combination of factors of production to a fixed factor or to a combination of fixed factors of production. It is not the result of the increased cost of calling additional units of a factor or factors of production from other industries into the expanding industry. Marshall seems to assume that the price of labor and capital remains constant. This assumption is implicit in his treatment of decreasing and constant as well as in his discussion of increasing cost. He does not, of course, assume the price of land to be fixed. But this does not affect his analysis, since neither marginal cost of production nor average cost to the representative firm includes the price of land.

but it is not necessarily timeless. It shows a demand situation which exists during a unit of time in which "the general circumstances of the market remain unchanged . . . there is, for instance, no change in fashion or taste, no new substitute which might affect the demand, no new invention to disturb the supply."⁷ But if an historical supply curve be Marshall's true concept, we have a supply curve which can not represent any backward movement of marginal cost of production in response to a decrease in the demand in either the schedule or market sense.

I believe that it is possible to argue with a show of reason that *both* concepts are to be found in Marshall's treatment of long-period normal price. His purely hypothetical curve seems to be of service when he is attempting to lay out the broad outlines of his theory — when he is strictly following the task given himself at the beginning of Book V, where he says:

We have now to examine the general relations of demand and supply; especially those which are connected with that adjustment of price, by which they are maintained in "equilibrium" . . .

Illustrations will be taken now from one class of economic problems and now from another, but the main course of the reasoning will be kept free from assumptions which specially belong to any particular class.

Thus it is not descriptive, *nor does it deal constructively with real problems.*⁸ But it sets out the theoretical backbone of our knowledge of the causes which govern value, and thus prepares the way for the construction which is to begin in the following Book. It aims not so much at the attainment of knowledge, as at the power to obtain and arrange knowledge with regard to two opposing sets of forces, those which impel man to economic efforts and sacrifices and those which hold him back.⁹

His curve becomes historical only after he has admitted, in Appendix H, sec. 3, that his theory is "out of touch with real conditions of life, in so far as it assumes that, if the normal production of a commodity increases and afterwards again diminishes to its old amount, the demand price and the supply price will return to their old positions for that amount."

7. Alfred Marshall, *op. cit.*, p. 342.

8. Italics mine.

9. Alfred Marshall, *op. cit.*, pp. 323-324.

This is tantamount to a declaration that his truly theoretical supply curve is not historical. We must remember, also, that his discussion and his diagrammatic representation of the effect of a specific tax on price is given as a part of his purely theoretical system.

In the light of this interpretation of Marshall's long-period supply curve, his conclusions respecting tax-price causation follow logically.¹ There can be no objection to Figures 1, 2, and 3, by which sharpness is given to his conclusions. If by assumption no change, other than the increase in supply schedule by the amount of the tax, is permitted to take place we are compelled to accept Marshall's conclusions and his diagrammatic representations of them.²

II

Marshall, then, was fully aware of the purely abstract character of his treatment of tax shifting and the laws of cost. With a generous use of assumptions he gave us an excellent theoretical analysis. I am ready to recognize the importance of this system as "an apparatus of the mind, a technique of thinking," but I have serious doubts as to its usefulness as a plan by which we can derive from facts "settled conclusions immediately applicable to policy." Such usefulness of a theoretical system depends either upon the degree of realism represented in the original assumptions or upon the extent to which they can be brought, through modification, to approach

1. For a more complete statement of Marshall's generalizations than is presented in this paper, see Marshall, *op. cit.*, pp. 467-470.

2. We are not, at this point, concerned with the reasonableness of Marshall's method or with the practical significance of his conclusions. That there may be circumstances under which the price would be increased by an amount greater than that which is shown in Figures 1, 2, and 3, is a fact stressed by Dr. Otto Frhr. von Mering, who argues correctly for the familiar point that, under conditions in which the tax is advanced by the producer, and where a long time elapses before recoupment by the consumer, the producer will add to his original supply price not only the amount of the tax but also an additional sum to cover the interest on the amount of the tax which he has advanced. Von Mering's brief but excellent discussion of this point is given in his *Die Steuer Überwälzung* (Jena, 1928), pp. 177-178. This point is, of course, not an exception but merely an addition to the Marshallian analysis.

that degree of realism demanded by those who would be guided by factual relationships in the determination of policy. If this statement is correct, we are led logically to a consideration of the fundamental assumptions which underlie the laws of cost as an approach to the problem of the effect of a specific tax on the price of the commodity upon which it is levied.

First of all there is the assumption of free competition. Professor Wolfe has well said, "One will have to make a long search in economic literature before he finds any serious discussion of the nature of free competition."³ It seems fair to say, however, that to Marshall free competition obtains under conditions where there is (1) complete and equal knowledge of the market on the part of both producers and consumers, (2) equal bargaining power of all persons in the market, (3) freedom of producers to undertake any line of production which offers superior economic gain — an assumption carrying with it complete mobility of the factors of production other than land, (4) a number of producers sufficient to cause each to ignore the effect of an increase in his output on price, and (5) complete indifference of consumers, except with regard to price, in the choice of producers from whom their purchases are made. The presence of all of these conditions in the market will establish, it is argued, but one price for the same commodity in that market at one and the same time.

No discussion is needed to show that these conditions are never wholly satisfied by the facts of real life. This does not mean, of course, that the notion of free competition is not a useful concept for purposes of analysis. It does mean, however, that conclusions based upon such an assumption are themselves unreal and not applicable to policy without modifications. The problem at this point is to discuss the nature and significance of these modifications.

In the past, economists have usually made allowance for variations from conditions (1) and (2) by admitting the existence of a "surplus of bargaining"—great in some cases, insignificant in others. Such an admission can be made with-

3. A. B. Wolfe, "Competitive Costs and the Rent of Business Ability," *Quarterly Journal of Economics*, vol. xxxix, November, 1924, p. 47.

out raising significant difficulties. The third requisite of a condition of free competition — free mobility of the factors of production — gives the pure theorist no trouble in his long-run analyses. Large investments in specialized capital, acquired skill, custom, home ties, strong preferences of entrepreneurs for certain lines of production, and all other forces which merely retard the mobility of the factors of production are of importance only in the short run. Difficulties which arise from these retarding influences, important in the short run, are completely ironed out in the long run — a period of time long enough for the factors of production of a commodity to be adjusted to the demand.⁴ The "long run" may cover a very short or a very long period of time. But in those cases where long-run effects require a long period of time, it must be remembered that forces ruled out in theoretical analyses by the assumption *Coeteris Paribus* but nevertheless operative in real life may make impossible the attainment of long-run results.

Another limitation of the use of the long-run concept in connection with the mobility of the factors of production may be illustrated by the case of a specific tax imposed upon the output of an industry for a period of time too short to cover the long-run period necessary for the mobility of the factors. In such a case the effect of the tax on price would be very different from that which would have been produced had it been continued over a period of time as long as, or longer than, the long run in the industry in question.

I do not deny the value of the long-run concept in abstract reasoning, but I maintain that it can throw no light on the important question of the probable behavior of the factors of production in the short run. The legislator is interested in the short as well as in the long-run effects of taxation. Before we can obtain the badly needed information on the short-run behavior of the factors of production in different industries at the same time and in the same industry at different times, study must be made of the forces which have in numerous

4. Alfred Marshall, *op. cit.*, p. 347.

and varied cases and under varied conditions determined the elasticity of supply in the short run.

Let us next consider the two final requisites of a purely competitive market. In actual market practice, do or do not individual producers consider the probable effect of an increase in their output on the price of their product? And, in reality, do buyers always deal with the cheapest sellers? Marshall throws no little light on these questions when he writes:

Everyone buys, and nearly every producer sells, to some extent in a "general" market, in which he is on about the same footing with others around him. But nearly everyone has also some "particular" markets; that is, some people or groups of people with whom he is in somewhat close touch; mutual knowledge and trust lead him to approach them, and them to approach him, in preference to strangers. A producer, a wholesale dealer, or a shopkeeper, who has built up a strong connection among purchasers of his goods, has a valuable property. He does not generally expect to get better prices from his clients than from others. But he expects to sell easily to them because they know and trust him; and he does not sell at low prices in order to call attention to his business, as he often does in a market where he is little known.⁵

It is in his distinction between the "general" and the "particular" market that Marshall suggests the argument that if all of a large number of producers of a standardized commodity are producing for a "general" market it is highly probable that no single producer will consider the effect of an increase in his output on price. He recognized but did not develop the point "that a market is commonly subdivided into regions within each of which one seller is in a quasi-monopolistic position."⁶ Significant elaborations of this point by Professors Wolfe, Sraffa, and Hotelling have made clear the fact that in the case of a commodity which has a particular as well as a general market we must, in the lan-

5. Alfred Marshall, *Industry and Trade*, 1927, p. 182. See also his *Principles of Economics*, pp. 458 and 501.

6. The quotation is from Prof. Harold Hotelling's "Stability in Competition," *Economic Journal*, vol. xxxix, March, 1929, p. 41. "The difference between the Standard Oil Company in its prime and the little corner grocery," writes Professor Hotelling, "is quantitative rather than qualitative. Between the perfect competition and monopoly of theory lie the actual cases." *Op. cit.*, p. 44.

guage of Marshall, couple the individual producer's supply curve for his own particular market with the demand curve for the same market, and his schedule of supply prices for the general market with the general demand schedule.⁷ The elasticity of both demand and supply will, in all probability, vary not only between the particular markets for the same commodity but also between the particular markets on the one hand and the general markets on the other. These variations will cause, of course, an equal specific tax to produce price changes of unequal proportions in the different particular markets and in the particular markets as contrasted with the general market. The magnitude of these discrepancies in the effect of the tax on price will vary inversely with the

7. Harold Hotelling, *op. cit.*; A. B. Wolfe, *op. cit.*; and Piero Sraffa, "The Laws of Return under Competitive Conditions," *Economic Journal*, vol. xxxvi, December, 1926, pp. 535-549.

This recognition of modified competition, as distinct from free competition, as the typical condition of actual markets accounts for the possibility of stable equilibrium in an industry operating under *conditions*, as distinct from the *law*, of decreasing cost due to internal economies. It shows how the fear of spoiling their particular market and the increase in the cost of marketing additional quantities of their commodity in the particular markets of their competitors will prevent the expansion of individual firms whose gains in internal economies, in the absence of an increase in demand in the schedule sense, would be more than offset by either a decrease in price in their particular market or an increased marketing cost involved in the further extension into the particular markets of their competitors, or both.

To the question whether marketing costs should or should not be included in the cost of production, I would say that my position is identical with that of my colleague, Prof. B. F. Haley, who argues, in commenting upon Professor Sraffa's position on this point, that "although to include marketing costs in the cost of production of a commodity may not be in accordance with Sraffa's definition of cost of production, it certainly is in accordance with that definition of cost of production which is most useful in the analysis of the relation between cost of production and supply price. It is true that demand is affected by sales expenditures, but it is also true that cost of production is increased by such expenditures. *Both* effects must be taken into consideration in any analysis of the determination of normal price and of the volume of production of a business enterprise. Sraffa is right in emphasizing the effect upon demand of marketing expenditures, but he is wrong in excluding such expenditures from the cost of production of a commodity."

Professor Sraffa's position is stated in *op. cit.*, pp. 542-550. Professor Haley's argument is taken from his doctoral dissertation, "A Preliminary Study of Laws of Varying Cost."

degree of commodity standardization, and will be affected by varying degrees of good will and by the unequal knowledge and rationality of consumers in the different particular markets. Dr. Holbrook Working in his excellent inductive study of "Factors Affecting the Price of Minnesota Potatoes" has shown that the potato market is not merely one large market, but that the general market is subdivided into many local markets, each with certain price determining factors peculiar to itself.⁸ Dr. Working's study makes logical the inference that a general and equal specific tax on potatoes would raise their price in different proportions in the various particular markets.

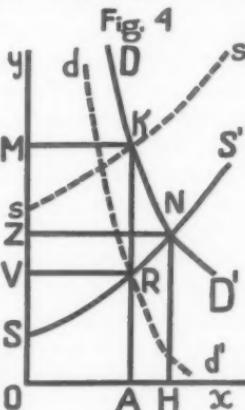
Obviously, it is important for practical purposes to have not only a theoretical system which will serve as a technique of forecasting the effect of a tax on the price of a commodity in the general market, but also to possess a scheme which will afford a basis for forecasting the magnitude of price changes in particular markets. The assumption of free competition, rigorously adhered to, precludes the development of the latter system. This assumption must be abandoned or significantly modified, if our conclusions are to be of value as guides to fiscal policy. One must include both the competitive and the non-competitive elements affecting the "particular" as well as the "general" supply and demand schedules. This cannot be done satisfactorily by shifting from the assumption of free competition to that of pure monopoly. On the contrary, conclusions applicable to policy can be deduced only from a realistic study of the forces which determine the elasticity of demand and of supply in the actual market to which they really belong.

Another fundamental assumption which is clearly implied by Marshall in his treatment of the problem of the effect of a specific tax on price does not permit variations in the scale of production in a given industry to cause a change in the cost of labor and capital to the producers in that industry. Changes

8. Holbrook Working, "Factors Affecting the Price of Minnesota Potatoes," University of Minnesota Agricultural Experiment Station Technical Bulletin, No. 29.

in the price of land, however, are not ruled out by this assumption. But such changes are, according to Marshall, the result and not the cause of changes in supply price. Under this assumption the effect on supply price of an equal decrease in the rate of output of an industry will be the same whether or not the decrease in the scale of production came as a result of a decrease in the demand in the schedule or in the market sense. But under conditions of real life, which may be as far from those of this assumption as from the zenith to the nadir, the *nature of the decrease* in demand is of great importance with respect to (1) changes in the cost of the factors, (2) changes in supply schedules, and (3) variations in equilibrium price.⁹

To illustrate this point, suppose that in Figure 4, DD' represents the demand for oranges. Let SS' represent the long-run supply schedule of oranges, which we assume to be produced subject to the law of increasing cost, before the imposition of a specific tax equal to Ss . The equilibrium price will be equal to HN or OZ . The total amount of money spent for oranges is represented by the rectangle $OINZ$. Next suppose that a radical change in popular taste has led to a decrease in the demand (in the schedule sense) for oranges — represented in our diagram by the curve dd' . The new equilibrium price of oranges is AR or OV , and the total amount spent for oranges is shown by the rectangle $OARV$. This rectangle is less in area than the rectangle $OINZ$, whose area indicated the total expenditure for oranges before the de-



9. Prof. H. G. Brown in his *Economics of Taxation* (1924), ch. II, and Prof. R. S. Merriam in his article "Supply Curves and Maximum Satisfaction" (Quarterly Journal of Economics, vol. xlii, February, 1928) allow for changes in the cost of the factors but fail to consider the fact that, even tho changes in demand in the schedule and in the market

crease in demand. This means, of course, that no reduction will be necessary in the expenditure for goods other than oranges. There will not, therefore, be a decrease in the total demand for the factors of production. With no decrease in total demand for the factors, their supply remaining the same, there will be no decrease in their cost to the producers of oranges. The new marginal cost of production AR is less than HN because an equal unit of labor and capital applied in the production of OA quantity of oranges yields a larger physical product than when applied farther out on the extensive or farther down on the intensive margin in the case of OH scale of production.

But is it proper to argue that no change will have taken place in the cost of the factors when the decrease in output from OH to OA is the result of a decrease in the demand for oranges, not in the schedule sense, but in the market sense? The correct answer is in the negative. If we grant for the moment the generally, tho not universally, accepted assumption that a specific tax causes no change in the demand schedule, we must then argue that such reduction as it causes in the scale of production is the result of a decrease in demand in the market sense. Let us refer again to Figure 4. We now assume that the demand for oranges is as indicated by DD' . The long period supply schedule, before the imposition of the tax, is SS' . Normal price is HN , scale of production is equal to OH , and the total expenditure for oranges is equal to $OHNZ$. Now let us suppose that a tax equal to Ss is placed upon each unit of oranges. If we employ Marshallian reasoning and diagrammatics, we must attempt to show the effect sense produce equal changes in the rate of production in an industry, their effects on the cost of the factors, on supply schedule, and on equilibrium price may be very unequal.

It is admitted, of course, that the assumption of a constant cost for the factors of production leads to no *significant* departure from reality in the case of commodities which use in their production such a small fraction of the factors that no likely variation in the output of such commodities could produce an appreciable effect upon the cost of the factors. But to speak from a practical angle, it may be argued that it seems highly probable that considerations of fiscal productivity would cause the legislator to be slow in choosing such commodities for taxation.

of this tax on price by drawing in the new supply curve ss' , which is higher than each point on SS' by a distance equal to the tax. This gives us a new equilibrium price equal to AK or OM , a scale of production equal to OA , and a total expenditure for oranges, *including the tax*, equal to $OAKM$. The area $OAKM$ is greater than $OHNZ$ — a fact which means that as a result of the tax there is a greater total expenditure for oranges, including the tax.¹ This means that there must be a decrease in the expenditure for some other good or goods.² Now this decrease in the expenditure, and consequently in the demand, for goods other than oranges is not offset by an increase in expenditure and in the demand for oranges, *excluding the tax*. The total expenditure for oranges, *including the tax*, is, according to Figure 4, $OAKM$; but from that amount must be subtracted a sum equal to $VRKM$. This latter sum goes, of course, into the public treasury. And in practically all discussion of specific tax shifting, the effect of the expenditure of the funds raised by the imposition of a tax is not permitted to affect demand schedules. When $VRKM$ is subtracted from $OAKM$, it is obvious from an examination of Figure 4 that less income reaches the producers of oranges than before the imposition of the tax, when their total income for oranges was equal to $OHNZ$.

As has been pointed out, the imposition of the tax on oranges led also, in our selected case, to a decrease in the

1. No attempt will here be made to demonstrate the obvious truth that a change in the volume of production resulting from a change in demand in either the schedule or market sense in an industry subject to the law of increasing, decreasing, or constant cost gives rise to intricate problems connected with the determination of the probable change in the price of the factors of production. It may, however, be pointed out that the total expenditure (including the tax) following a decrease in demand in the market sense, produced by the imposition of a specific tax on a given commodity, will always be greater than the total expenditure for the same commodity following a decrease in demand in the schedule sense; and greater or less than the original expenditure before the imposition of the tax, depending upon the small or great degree of elasticity of demand and supply.

2. At this point we are granting two familiar assumptions of pure theory, namely (1) a constant volume and velocity of money and credit, (2) no increase in exertion or in saving because of the disinclination to economize on goods, other than oranges.

expenditure for goods other than oranges. Still refusing to permit the public expenditure of VRKM to affect demand schedules, let us assume that the decrease in expenditure for goods other than oranges takes place in the case of grapefruit and lemons. This will decrease somewhat the demand for the factors of production in the growing of grapefruit and lemons and will in turn lower the cost of these factors to the producers of oranges. This follows logically from the reduction which has taken place in the total demand for citrus products — a reduction which, so far as the cost of the factors of production to the orange growers is concerned, is not offset by an increase in the demand for goods other than oranges. Whether or not the cost of the factors to the orange growers will in the long run remain below, become equal to, or rise above AR (Figure 4) is a question the answer to which depends upon the conditions of cost which govern the production of the labor and the capital goods required in the citrus industry.

It is unreasonable, therefore, to argue that AR will be the marginal cost of production for OA rate of flow, regardless of the nature of the change in demand which reduced the rate of production from OH to OA. In our illustration, if AR were the marginal cost when the reduction in output came as a result of a decrease in demand in the *schedule* sense, it will be in all probability a different amount when an equal reduction in output is brought about by a specific tax which causes a decrease in demand in the *market* sense. In short, the supply schedule which refers to variations in rates of output resulting from changes in demand in the *schedule* sense does not, unless by accident, show the supply price for each several rate of output which results from a change in demand in the *market* sense. Hence it is improper to attempt to show the effect of a tax on price by superimposing the new supply schedule, including the tax, upon the original supply curve SS'.

The admission of the very real probability of a change in the cost of the factors of production following a decrease in demand (in the *market* sense) resulting from the imposition of a specific tax upon a given commodity introduces anarchy into any attempt to represent diagrammatically the effect of

a specific tax on the price of a commodity subject to the law of increasing, decreasing, or constant cost. The fact that a greater total amount may be expended for a commodity, including the tax, after a specific tax has been levied upon it, means that, other things equal, less must be spent upon some other commodity or commodities.³ The degree to which the cost of the factors of production will be changed to the producers of the taxed commodity depends to an important extent upon "the adaptability to its production of the resources released by the reduced demand elsewhere."⁴ The amount of change in the cost of the factors to the producers of oranges, after the imposition of the tax, would, for example, be much less if the greater total expenditure for them led to a decrease in the demand for radios than if it caused a decline in the consumption of grapefruit and lemons. I agree, therefore, with Professor Meriam who, in discussing a quite different problem, says: "there is not one cost curve for a commodity, but several."⁵

The validity of the conclusion which has just been reached depends in part upon the assumption that the public expenditure of the revenues obtained from the tax on oranges shall not be permitted to affect demand schedules which are pertinent to the problem under consideration. The conclusion would remain valid, however, unless all of the public revenue

3. Under the phrase "other things equal" attention is again called to the two conditions mentioned in footnote number 2, p. 693: first, that the volume and velocity of money and credit remain constant, and second, that the disinclination to economize on commodities other than oranges does not lead to increased exertions or increased abstinence.

4. On page 694 it was pointed out that the law of cost governing the production of labor and capital required in an industry is also a factor in the determination of the long-run cost of these factors of production to the producers of the taxed commodity.

It seems fair to believe that Marshall would not deny that the rent which the land would yield under grapefruit and lemons affects the marginal costs which must be covered by the price of oranges. This means that he would admit that a decrease in the demand for grapefruit and lemons, without a corresponding increase in the demand for oranges or for some other product which would offset this decrease, would decrease the marginal cost of oranges. See Marshall's *Principles of Economics*, 8th ed., pp. 435-438.

5. R. S. Meriam, *op. cit.*, p. 182.

raised by the tax on oranges were expended by the government for oranges or for some other commodity or commodities for which the increased demand would fully offset the decrease in the demand for grapefruit and lemons which was brought about by the tax and the consequent increased expenditure — including the tax — for oranges. That the validity of the conclusion should ever be destroyed by the development of such a condition seems highly improbable. The expenditure of the orange-tax revenues for the construction of public buildings, highways, battleships, and for salaries of public officials would not, in all probability, ever affect commodity demand schedules in a direction and to a degree which would prevent the repercussion of the specific tax on oranges upon their original supply schedule. This, however, is not to be taken as an argument for the reasonableness of the assumption — common to orthodox analyses of the effect of specific tax shifting on price — which does not permit the expenditure of revenue raised by the imposition of a tax upon a given commodity to affect the demand schedule of that commodity. An evaluation of the reasonableness of this assumption is the next task to be undertaken.

To our knowledge the late Professor Edgeworth was the first writer to recognize that this assumption did not square with the facts. Concerning this point he wrote:

Rates on houses when expended in improving the neighbourhood tend to increase the demand for houses. Yet in measuring the burden of the tax to the owner it is allowable *in pure theory* to abstract its influence on demand.⁶

This statement shows clearly that Edgeworth realized that one could not legitimately abstract its influence on demand when dealing with real problems.

Professor Kendrick has recently argued (without reference, however, to Edgeworth's contention) that the pure theory of the incidence of a tax must take account of "the expenditure of the funds exacted by it."⁷ He shows conclusively that the

6. F. Y. Edgeworth, "The Pure Theory of Taxation," *Economic Journal*, vol. vii, 1897, p. 52. The italics are mine.

7. M. Slade Kendrick, "Public Expenditure in Tax Incidence Theory," *American Economic Review*, vol. xx, June, 1930, pp. 226-230.

expenditure of funds collected from the imposition of a tax on a commodity subject to the law of increasing cost, for a purpose or for purposes which will in time cause an increase in the demand for that commodity, will in the long run be followed by an increase in its price by an amount greater than the tax. If, however, the commodity is subject to the law of decreasing cost, such expenditure will be followed by a new equilibrium price less in amount than the original.⁸

Evidently Professor Kendrick deserves the credit of having hit quite independently upon the idea of the possible effect of public expenditure of funds from the taxation of a commodity upon the demand for that commodity; otherwise it is difficult to explain his failure to recognize Edgeworth's contribution.

Professor Kendrick's argument for the "recognition of expenditure in an analysis of tax incidence" is as follows: "If it be granted, as current incidence theory assumes, that the incidence of a tax is a function of the particular supply-demand relationship of the object upon which the tax is levied, it follows that any factor introduced by the tax which changes this relationship is pertinent to the question of the incidence of this tax. This conclusion is inevitable — to conclude otherwise is to say that the incidence of a tax must be determined by the supply-demand relationship of the tax object which existed *before* and not *after* the imposition of the tax, even tho on account of the tax, this supply-demand relationship has changed. Therefore, if it can be shown that the expenditure of the funds yielded by a tax, changes the supply-demand relationship of the object taxed, a consideration of such effects of this expenditure is relevant to the analysis of the incidence of this tax." Op. cit., p. 227.

Professor Kendrick gives as illustrations of his principle (1) the case of the gasoline tax, the revenue from which is spent for roads which in turn increase the demand for gasoline and (2) the funds from a tax on milk spent in acquainting the public with the merits of milk as a food. He points out the fact that such expenditures may result in a change in the elasticity of the demand curve for a given commodity as well as in a shift in the demand curve itself.

The argument and illustrations presented by Professor Kendrick prove untenable the position taken by Professor Lutz in his *Public Finance*, 2d ed., 1929, p. 323, where he argues that "In order that a tax may be shifted, some form of economic compulsion is necessary; that is, the buyer must be made to pay more than before. *Since buyers are free agents, and since there is nothing about the levy of a tax that would increase the utility of the object taxed*, there is no way of directly compelling the buyer to pay more. The compulsion must be exerted indirectly, by influencing the available supply of the object taxed." The italics are mine.

8. Professor Kendrick properly omits the discussion of the case of constant cost; for it is clear that, granting all other assumptions of the laws-of-cost approach, the expenditure of funds yielded by a tax on a

It follows from the foregoing argument that if the laws-of-cost approach to the problem of tax shifting and incidence is to become a reasonable theoretical system — one around which facts may be intelligently organized — its fundamental assumptions must be modified at least to a degree and in a manner which will permit it to recognize the causal relationship between taxation, public expenditure, demand schedule, and equilibrium price.

In this connection we must recall still another concession to realism — one made by Marshall in his *Principles of Economics*, Appendix H, pp. 807-808. Here Marshall states that "the list of demand prices which holds for the forward movement of the production of a commodity will seldom hold for the return movement, but will in general require to be raised." To this statement he adds a footnote which says: "That is, for any backward movement of the amount offered for sale, the left end of the demand curve would probably need to be raised in order to make it represent the new conditions of demand."

A final practical shortcoming of the theoretical systems of all economists who use the laws of cost as an approach to the problem of the effect of a specific tax on price, arises from the fact that their supply curves are constructed under the assumption that an industry obeys only one particular law of cost throughout the entire range of its possible scale of production. Such curves give a looseness of fit when brought into contact with real economic conditions under which "the same industry may, of course, obey one of these laws in respect to some quantities of output and another in respect of other quantities."⁹ Marshall recognized the practical significance of this fact when he said: "A commodity subject to the law of constant cost can produce no other than the generally accepted result of causing price to be increased by an amount equal to the tax."

9. The quotation is from A. C. Pigou's, "An Analysis of Supply," *Economic Journal*, vol. xxxviii, June, 1928, p. 238.

Prof. Myron Watkins puts the matter succinctly as follows: "In technical language, production in any particular line may be carried on under conditions of increasing cost, constant cost, or diminishing cost. It should be noted, however, that a single one of these conditions may not hold throughout an indefinite range of production. For example, it

nificance of this fact, and put the matter clearly when he wrote:

If it [a commodity] obeys first one [law of return], and then the other, so that the supply curve is at one part inclined positively and at another negatively, no general rule can be laid down as to the effect on price of increased facilities of supply, though in every case this must lead to an increased volume of production. A great variety of curious results can be got by giving the supply curve different shapes, and in particular such as cut the demand curve more than once.¹

To make his reasoning directly expressive of the unsatisfactory character of the supply curve of theory for the purpose of forecasting the effect of a specific tax on price in a real market, we need only to paraphrase in Marshall's own language a portion of his statement to read as follows: No general rule can be laid down as to the effect on price of a tax which, for the sake of brevity, may be taken as representative of those changes which may cause a general increase in the normal supply price, tho in every case this must lead to a decreased volume of production. The difficulties of the problem are significantly increased by the fact that historically it is possible for an industry to exhibit one cost condition during its response to an *increase* in demand (in the schedule sense), to show another in consequence of contraction in rate of output brought about by a decrease in demand in the schedule sense, and to display still a third when the decrease in the scale of production has been caused by a decrease in demand in the market sense.²

may be that up to a certain limit an increased product may be had at a constant unit cost while increasing the production beyond that limit may mean lower unit costs. Again, the forces responsible for this latter tendency may become exhausted and beyond that point increasing the volume of production may bring higher and higher unit costs. It is more accurate, therefore, to say that an industry is in a *stage* of constant cost, diminishing cost, or increasing cost, as the case may be." Industrial Combinations and Public Policy (1927), p. 88.

1. Principles of Economics, p. 466.

2. Professor Bullock, writing in the Quarterly Journal of Economics, August, 1902, p. 505, stated that Mr. Sidgwick seemed to be the only economist who had appreciated the fact that a decrease in the demand for a commodity subject to the law of decreasing cost might diminish the number of firms in the industry and lead to lower rather than to higher marginal cost. Evidently Professor Bullock had overlooked the

The importance of these concessions to realism cannot be denied. If they do not justify the renouncement of the laws of cost in the analysis of specific tax shifting, they must cause us to agree with Professor von Mering when he states that "in tax shifting we must consider the law [condition] of cost existing at the time rather than the one which might otherwise have developed."³

Not only does the use of the laws of cost give rise to the troublesome but important difficulties which have just been discussed, but it also means that no answer can be given to such significant problems as (1) the variations in the effect of a tax according to the stage of the business cycle in which it is imposed, (2) the relation of the degree of utilization of fixed plant to the effect of specific taxation on price, and (3) the difference in the effect on price between a tax which does and one which does not cause such a great reduction in demand in the market sense (and, therefore, in the scale of production) as will bring about a radical change in the technique of production — from motor to horse power for example. Changes of this nature are, of course, not allowed to show their influence in the hypothetical supply curve of pure theory.⁴

statement made by Professor Carver in an article entitled, "The Shifting of Taxes," *Yale Review*, vol. v, November, 1896, footnote, p. 263; Professor Carver's statement is as follows: "It is quite conceivable that a tax on an industry of increasing returns might simply drive some of the weaker competitors out of the business and enable the survivors to produce on a larger scale, and consequently, more cheaply. They might even be able to sell the product at the original price, being reimbursed for the tax by the reduction in the cost of production. In the absence, however, of satisfactory data, this is only a tentative conclusion."

Marshall readily admits the *possibility, under the real conditions of life*, of the result pictured by Professor Bullock. Such a result is unthinkable, however, so long as we talk in terms of Marshall's purely theoretical supply curves which, as we know, are avowedly hypothetical, non-descriptive, and non-historical. For Marshall's discussion of this point, see his *Principles of Economics*, Appendix H, footnotes, pp. 806-812.

3. Otto Frhr. von Mering, *Die Steuerüberwälzung* (Jena, 1928), p. 49.

4. The construction of the supply curves of pure theory requires the performance of the very difficult task — a task particularly difficult in these days of the elaborate experimental laboratory — of excluding from view any economies that may result from "substantive new inventions"

In real life specific taxes are levied upon actual economic goods — wheat, trucks, and tobacco, for example. These goods do not flow from the channels of production with the appropriate laws-of-cost label already attached to them by the hand of a kind Providence. Therefore, in order to determine the effect of a specific tax on the price of a commodity, the industry which produced it must, first of all, be placed into the proper "economic box." To fit an industry, subject to variations in its cost conditions, into a nebulous economic box which has been carefully surrounded by a heavy guard of heroic assumptions, is, as several economists have recognized, an extremely difficult if not an impossible task.⁵ Pro- and of including "those which may be expected to arise naturally out of adaptations of existing ideas."

5. Professor Bullock was aware of this difficulty when he wrote: "Our conclusion is, therefore, that under dynamic conditions we find a law of decreasing and a law of increasing marginal cost, when we consider the efficiency of land, labor, and capital employed in the production of the entire supply of a commodity. It seems to be impossible, however, to assign any particular commodity or industry a fixed place in schemes of classification based upon these laws; and it is especially important to remember that the result of any alteration of supply may depend upon the extent of the change that is to be effected. Before applying these laws to any concrete case, we need far more serious study than has yet been made of the actual conditions of the industry in question. Without such particular investigation, attempts to utilize the laws of increasing or decreasing cost are as likely to cause error as to conduce to scientific insight." *Op. cit.*, pp. 500-501.

Professor Clapham has questioned not only the possibility of filling the economic boxes but also the utility of the knowledge, "apart from the satisfaction of a legitimate scientific curiosity," gained from a satisfactory filling of such boxes. He states that one cannot think of an industrial monograph in which profitable use was made of the Laws of Returns in commenting upon the things of life. "Of Economic Boxes," *Economic Journal*, vol. xxxii, September, 1922, pp. 305-314.

Professor Pigou writes: "to know that a particular article . . . is being produced under conditions of increasing or diminishing returns is to know very little indeed about it." "Empty Economic Boxes: A Reply," *Economic Journal*, vol. xxxii, December, 1922, p. 462.

Professor Taussig states a case which shows the difficulties of fitting or using the "laws" of cost classification for practical purposes. In his *Principles of Economics*, ii, 71, he writes: "It seems paradoxical to say that there is a real tendency to diminishing returns, and also that in fact there have been increasing returns. Yet both statements are true . . . agricultural labor in the United States and in most parts of Europe is applied with much more intelligence and with better effect than five

fessor Clapham, for example, has not yet been able to secure payment on the check given him years ago by Professor Pigou on the "bank of an unborn Jevons." And even if the possibility of "boxing" an industry were granted, it must be admitted that the conclusions based upon the tax-price relationships in such an imaginary environment are not directly applicable to real situations. And the degree of modification required to make them so brings us to conclude that the laws of cost are, by themselves, incapable of aiding directly the legislator who would apply a knowledge of tax-price causation to the determination of fiscal policy.⁶

But altho such analysis has been unable to guide taxation policy directly, and is extremely unlikely to do so in the future, there is no denying its service in pointing out the forces which must and those which must not be regarded as influencing long-run normal price in the perfect market of pure theory.⁷ In doing this it has shown specifically its points of weakness as a scheme for explaining tax-price behavior in a real market. The generous list of price-determining forces

hundred years ago, or one hundred years ago." In vol. i of his *Principles of Economics*, pp. 183-185, Professor Taussig shows how hard it is to fit, even roughly, a specific industry into its proper economic box.

Professor Strafffa, *op. cit.*, p. 538, shows that the breadth of the definition which we assume for "an industry" is an important factor in its classification according to the law of cost under which it operates.

Professor Silberling in his "Graphic Illustrations of the Laws of Price," *American Economic Review*, vol. xiv, September, 1924, p. 438, cites Professors Dewing and Weld who maintain that the principle of decreasing cost does not apply to all types of manufacturing.

6. Bunzel is quite as severe and even more sweeping when he writes: "dass die bisherigen Ergebnisse der Theorie der Steuerüberwälzung für die Praxis (Steuergesetzgebung und Steuerverwaltung) so gut wie unverwertbar sind." Quoted in Dr. Rolf Grabower's "Die Steuerüberwälzungstheorie, ein Beitrag zum neuesten Schrifttum," *Vierteljahrsschrift für Steuer-und Finanzrecht*, 1928, Heft 3, p. 469.

7. We also agree, however, with Professor Clapham's statement which runs as follows: "I think a good deal of harm has been done through omission to make it quite clear that the Laws of Returns have never been attached to specific industries; that the boxes are, in fact, empty. . . . Unless we have a good prospect in the near future of filling the boxes reasonably full, there is, I hold, grave danger to an essentially practical science such as Economics in the elaboration of hypothetical conclusions about, say, human welfare and taxes in relation to industries which cannot be specified." *Op. cit.*, p. 312.

which have been so carefully and specifically excluded from the perfect market affords valuable suggestions concerning the nature and organization of forces which must be included in any theoretical system which would throw light upon the real problems of tax shifting. These lessons should aid us in the attempt to present suggestions for a method or combination of methods which may enable us to forecast to a greater degree of accuracy than is now possible the effect of a specific tax levied upon a real commodity in a real market.

III

Altho doubt has been expressed as to the efficacy of the analysis of tax-price relationships which has been reviewed in the previous sections of this paper, the conclusion should not be drawn that deductive is to be rejected in favor of inductive analysis. The issue does not involve the time-worn controversy over the relative merits of the deductive versus the inductive method. Rather, it is the problem of selecting the most reasonable method or combination of methods, whether deductive or inductive, which may be utilized in determining actual tax-price relationships. In the opinion of the writer there are two methods which offer greater promise in this direction than does the laws-of-cost analysis. These may be designated as (1) the purely statistical method and (2) the theoretical-statistical method. It will be seen in the discussion which follows that these methods are not mutually exclusive.

Let us discuss first the purely statistical method. By this an attempt is made to prove statistically the effect of an actual tax upon the price of the commodity upon which it was levied. Studies of this type, covering a long period of time, would be made wherever possible. After a time there would be secured a record of the actual effect on price of a specific tax on different commodities and upon the same commodity under a wide range of conditions. This record of actual tax-price relationships (including a statement of all the significant conditions under which such relationships were established) would be used in forecasting the probable effect

of a specific tax, under like or similar conditions, on the price of any one of these commodities.

Dr. E. Laspeyres' "Statistical Investigations of the Problem of Shifting of Taxation, Conducted in the History of the Prussian Milling Tax and Tax on Cattle Slaughtered for Meat"⁸ is the only purely statistical study of tax shifting with which I am familiar.⁹ This excellent study, under the motto, "Can one, statistically, prove *a post hoc* to be *propter hoc*?" represents more than twenty years of painstaking investigation of the effect on price of the abolition of the Prussian milling tax and of the tax on cattle slaughtered for meat. Laspeyres was particularly favored in this investigation by the fact that he was able to compare price changes in tax-cities with those in the non-tax-cities in different parts of the same country, Germany. He recognized, to use his own words,

that in the movement of the price of the articles which had been subject to the tax one sees reflected the *total effect of all price-determining factors, among which only one is represented by the abolition of the tax*. Thus, the effect of the abolition of the tax cannot be ascertained from the movement of the articles in question at the time of the abolition of the tax, but rather one must compare the movements of price *in other cities (the non-tax cities), of other goods (tax free goods), at other times (non-abolition of tax)* with the movement of price *in tax cities, with regard to the goods subject to the tax, at the time of the abolition of the tax*, computing from the difference in these movements the share the abolition of the tax has in the whole movement of price.¹

He was also careful not to ignore the important and difficult question "*of whether the tax cities and the non-tax cities were equal in all respects except the question of tax, or, if this was not the case, in how much they were different from one another, disregarding the abolition of the tax.*"²

This very brief outline of Laspeyres' method of investigation

8. E. Laspeyres, "Statist. Untersuchungen zur Frage der Steuerüberwälzung, geführt an der Geschichte der preussischen Mahl- und Schlachsteuer," *Finanz-Archiv*, 1901, pp. 46-242.

9. Dr. von Mering in his *Die Steuerüberwälzung*, pp. 9-15, mentions a number of statistical investigations of tax shifting by the writers Gerloff, Hellwig, Lehmann, Mildschuh, and Schott.

1. E. Laspeyres, *op. cit.*, pp. 50-51.

2. *Ibid.*, pp. 51-52.

tion gives an example of the purely statistical treatment of the problem of the effect of tax on price. Investigations of this type must be laborious and painstaking and may yield but a modicum of truth. But before this fact can be advanced as a valid criticism of this method, there must be offered an alternative which will give greater results with less effort. It would also be well in this connection to recall, as Laspeyres would have us do, the extent to which measurements and calculations must be carried on in other fields of research in order to lead to the smallest results.³

Prof. Hugh Dalton is prominent among those who express little or no hope for light on the problem of tax shifting from statistical investigations. His skepticism grows from (1) the fact that the *ideal data* for the statistical determination of the effect of a tax on price cannot be secured and (2) because "a tax is only one of a large number of factors, which determine the price of a taxed commodity, and the effect on its price of changes in the tax may be, and often are, small compared with the effect of changes in the other factors."⁴ Professor Dalton is correct when he states that it is impossible to secure *ideal data* for the statistical determination of tax incidence, but Laspeyres' method and results may be cited in support of the contention that the purely statistical attack upon the problem is not fruitless but is capable of making significant additions to our present limited knowledge of tax-price causation.⁵

3. E. Laspeyres, *op. cit.*, p. 48.

4. Hugh Dalton, *Principles of Public Finance*, 6th ed., pp. 71-72.

Regarding the nature of the data necessary for a satisfactory statistical treatment of the effect of a tax on price, Dalton writes: "in order to determine the incidence of a tax from price statistics, what should be compared with the price of the commodity at one time or place with the tax on, is not the price at a *different* time or place with the tax off, but the price at *the same* time or place with the tax off. And obviously there will be no statistical record of the latter price. For it is not any price which ever actually existed, but a price which would have existed, if certain conditions had been different." *Op. cit.*, p. 72. This same skepticism is shown in the writings of Prof. G. F. Shirras, *The Science of Public Finance*, 1925, p. 189, and of Dr. Otto Frhr. von Mering, *op. cit.*, pp. 9-15.

5. In his summary Dr. Grabower (*op. cit.*, p. 503) points out that in the transactions of the "Verein für Sozialpolitik," which dealt with the question of shifting and incidence of taxation and took place at Vienna

There is, however, a truly important practical limitation of the purely statistical method. This limitation arises from the fact that in order to use the results of this method in forecasting the effect of a tax on price under an actual set of market conditions, a tax of the same or like character must actually have been in existence for an adequate length of time and under comparable conditions. This limitation is not, however, a characteristic of the theoretical-statistical method. In its freedom from this limitation, the theoretical-statistical method shows a marked superiority over the purely statistical method of investigation in the field of tax shifting.

It has been shown that in the use of the purely statistical method, tax-price relationships are analyzed without the aid of any particular theory of price determination. When the theoretical-statistical method is employed the problem of specific tax shifting is approached through an equilibrium theory of price. The reasonableness of the proposition that price is determined by the equilibrium of supply and demand is accepted as a starting point. Next an attempt is made to determine the *statistical* laws of supply and demand. That is to say, an effort is made to discover the price-quantity relationships of actual commodities in the real markets to which these relationships properly belong.⁶ To be more specific, there is set up, first of all, the *time* and *space* limitations of the market in which the price-quantity relationships of a commodity are to be discovered. The next move is an attempt to discover from price statistics the *rate* of demand and of supply in 1926, "it was stated with an unanimity rare in this sphere that it is necessary for the solution of the problem to increase the depth of experience; as in the case of natural science the twentieth century is also to this matter the century of quantitative analysis."

At this point the writer wishes to acknowledge that without the assistance of Dr. H. T. Haupt of Santa Monica, California, he would have been unable to translate the last thirty pages of Professor Grabower's article. Grabower's style is so involved that even with the help of an experienced translator it was difficult at times to be certain of the correctness of the translation.

6. Edgeworth pointed out the necessity of distinguishing "between the elasticity of supply according as short or long periods are considered." "The Pure Theory of Taxation," Economic Journal, vol. vii, 1897, p. 49.

(before the imposition of the tax) for each several price in the particular market in which tax-price behavior is to be observed.⁷ In short, an endeavor is made to establish *statistically* the elasticity of demand and supply appropriate to the *time* and *space* dimensions of the market in which the tax is to be imposed. With the aid of these statistically determined demand and supply curves, one could show the approximate effect of a specific tax on the price of a commodity in the market to which these curves were appropriate. This could be done by adding the amount of the tax to each several supply price and then drawing a new supply curve which would be higher than the old by the amount of the tax. The degree of accuracy in the result secured by this method would depend upon (1) the elasticity of the pre-tax demand and supply and (2) upon the purpose or purposes for which the public revenues, derived from the tax, were expended. For example, if SS' in Figure 4 were a statistical supply curve, it would show that producers were willing to supply OA quantity of a given commodity at a price equal to AR, only under the condition that an amount equal to OARV, and no other amount, were expended for the commodity. It must be admitted, therefore, in the case of the statistical supply curve as well as in that of the supply curve of pure theory, that the effect on the pre-tax supply and demand schedules of the public collection and expenditure of an amount equal to VRKM (in Figure 4) is ignored.⁸

The superiority of the statistical over the theoretical supply schedule arises from the fact that there is inherent in the

7. We are here using *rate*, in the Marshallian sense, to mean the flow or output of a commodity in a year, or any other unit of time. See Marshall, *Principles of Economics*, pp. 343-344.

8. The argument presented on this point in connection with the theoretical or Marshallian supply curve (pp. 690-695) is relevant also to the case of the statistical supply curve.

It is unlikely that the *psychological* effect of the burden of a tax levied upon only one commodity, or even upon only a few commodities, would affect the effort and saving resistances to production in general to a degree which would necessitate a redrawing of the original (pre-tax) supply schedule.

former *only one* of the several shortcomings which have been shown to appertain to the latter.⁹ Therefore, in spite of the above-mentioned limitation of the statistical supply curve, I still contend that the theoretical-statistical method is a more promising technique of forecasting actual tax-price relationships than is the approach through the laws of cost. The weakness of the statistical supply curve does suggest, however, the importance of supplementing, wherever possible, theoretical-statistical analyses with purely statistical studies.

Professors Carver, Edgeworth, Dalton, and von Mering have stressed in their respective discussions of tax shifting, the importance of the elasticity of supply and of demand in the determination of the effect of a specific tax on price.¹ The supply and demand curves employed in their analyses are, however, purely hypothetical. They tell us only the nature of the facts which we must secure in order to forecast price behavior in response to a specific tax. The statistically determined supply and demand curves would, however, give us the actual average reaction of producers and of consumers to a given change in the price of a real commodity in a real market. They would "summarize in a sort of 'mental shorthand' the whole mesh of environing conditions affecting supply" and demand.² That this is an extremely difficult task no one can deny. "The derivation of concrete, statistical laws of supply and demand," says Professor Schultz, "is beset with many difficulties, both theoretical and practical." But Professor Schultz is of the opinion that most of these difficulties "can be overcome through the judicious use of

9. We are thinking here of the many assumptions, discussed in Part II of this paper, which make impossible the use of the theoretical supply curve in the forecasting of *actual* tax-price behavior.

1. T. N. Carver, "The Incidence of Costs," *Economic Journal*, vol. xxxiv, December, 1924, pp. 576-588.

Hugh Dalton, *Principles of Public Finance*, 6th ed., pp. 54-84.

F. Y. Edgeworth, "Pure Theory of Taxation," *Economic Journal*, vol. vii, 1897, pp. 46-54.

Otto Frhr., von Mering, *op. cit.*, pp. 47-69.

2. Henry Schultz, "Cost of Production, Supply and Demand, and the Tariff," *Journal of Farm Economics*, vol. ix, April, 1927, p. 209.

modern statistical methods."³ Even tho some economists might argue that Professor Schultz is too sanguine of success, they must nevertheless admit that the important developments in statistical technique in the brief period since the time of Jevons, and the excellent studies which show the importance of improved statistical technique in the determination of the statistical laws of supply and demand, justify, beyond question, encouragement to the theoretical-statistical analysis of the problem of specific tax shifting.⁴

The element of *time*, admitting as it does important changes in "environing conditions," will always make impossible a *perfect* statistical determination of supply and demand elasticities. But I believe that a record, tho imperfect, of the reactions of producers and consumers to specific price changes of a given commodity in a definite market during a given period of time in the past (together with an account or description of the "environing conditions" of that market during the specified period) is the best possible basis upon which to forecast the probable effect of a specific tax on the price of that commodity in that market.⁵

If this statement is correct, and if the earlier conclusions of this paper are valid, it is clear that future studies of the problem of specific tax shifting should be devoted, first, to the

3. *Ibid.*, pp. 202-203.

4. To mention only a few of these studies, we refer to Dr. M. Ezekiel's "Statistical Analysis and the 'Laws' of Price," *Quarterly Journal of Economics*, vol. xlii, February, 1928, pp. 199-227; Holbrook Working's "The Statistical Determination of Demand Curves," *Quarterly Journal of Economics*, vol. xxxix, August, 1925, pp. 503-543. (Professor Working gives a bibliography at the close of this article); Henry Schultz's *Statistical Laws of Supply and Demand*, 1928; and G. F. Warren and F. A. Pearson's "Interrelationships of Supply and Price," *Cornell University Agricultural Experiment Bulletin* No. 466, March, 1928.

5. Dr. Rolf Grabower, *op. cit.*, pp. 489-503, advocates a careful study of the way in which individual firms have actually treated tax impositions in their accounting procedures. He believes that the youthful science of industrial management (*Betriebswirtschaftslehre*) may be made helpful in explaining the processes of tax shifting. We agree that a collection of the industrial histories of a large number of firms (particularly if the history of a specific firm shows that firm's relation to its general economic and social conjuncture) can be made to shed much light upon the question of tax-price behavior.

statistical determination of elasticities of supply and of demand (together with an account of "environing conditions") for different commodities in the same market and for the same commodity in different markets; and, second, to the determination, by use of the purely statistical method, of the effect on price of actual specific taxes levied in the past upon real commodities in real markets.⁶ Without the results of such studies, there is no answer to Row-Fogo, at least with respect to specific taxes, when he charges that the economist's theory of tax incidence is only an involved manner of saying, "Goodness knows."⁷

ELMER D. FAGAN.

STANFORD UNIVERSITY

6. Professor Pigou argues correctly when he says: "In order to get a definite result — to be able to say by how much, in actual pounds, shillings and pence, prices would go up (*following the imposition of a specific tax*) . . . we must know the exact shape of the relevant part of the supply curve for hats and also the exact shape of the relevant part of the demand curve; in more general, if less exact, terms, we must know the numerical values of the elasticities of supply and demand for quantities of hats in the neighbourhood of the quantity that is actually being produced, and the relation of these elasticities to the passage of various intervals of time. . . .

"There is already available a certain amount of statistical material — and we may reasonably hope that this material will both grow in quantity and improve in quality — from which students with the requisite mathematical equipment may make rough deductions about the shapes of certain supply schedules. On the side of demand something on these lines has already been accomplished." "Empty Economic Boxes: A Reply," *Economic Journal*, vol. xxxii, December, 1922, pp. 463, 465. Italics mine.

On the importance of statistical analysis, Sir Josiah Stamp goes so far as to state that "an improved statistical technique in the handling of social data is absolutely vital to the further progress of economic science." *Current Problems in Finance and Government*, second impression, 1925, p. 11.

7. J. Row-Fogo, *An Essay on the Reform of Local Taxation in England*, 1902, p. 110.

BOOKS RECEIVED

ANDREADES, A. M. *A History of Greek Public Finance*. Cambridge: Harvard University Press. 1933. pp. 412. \$6.00.

ANGELL, JAMES W. *Financial Foreign Policy of the United States*. New York: Council on Foreign Relations. 1933. pp. 146. [A Report to the Second International Studies Conference on The State and Economic Life, London, May 29 to June 2, 1933.]

ARGENTINA: BANCO DE LA NACION. *Annual Report and Balance Sheet for the Financial Year 1931*. Buenos Aires: The Bank. 1932. pp. 58.

BARKIN, SOLOMON. *The Older Worker in Industry*. Albany: J. B. Lyon Company. 1933. pp. 467. [A Report to the Joint Legislative Committee on Unemployment Prepared Under the Auspices of the Continuation Committee of the New York State Commission on Old Age Security.]

BERNARDELLI, HARRO. *Die Grundlagen der Ökonomischen Theorie*. Tübingen: J. C. B. Mohr. 1933. pp. 100.

BIDWELL, PERCY W. *Tariff Policy of the United States*. New York: Council on Foreign Relations, Inc. 1933. pp. 126. [A Report to the Second International Studies Conference on The State and Economic Life, London, May 29 to June 2, 1933.]

BLACK, JOHN D. *Research in Rural Organization*. New York: Social Science Research Council. 1933. pp. 160. [Bulletin No. 12.]

—. *Research in Transportation in Relation to Agriculture — Scope and Method*. New York: Social Science Research Council. 1933. pp. 94. 75 cents. [Bulletin No. 8.]

BOUCKE, O. FRED. *Europe and the American Tariff*. New York: Thomas Y. Crowell Company. 1933. pp. 157. \$1.50.

BRADFORD, FREDERICK A. *Money*. New York: Longmans, Green, and Company. 1933. pp. 413. \$2.50.

CAMPBELL, PERSIA C. *American Agricultural Policy*. London: P. S. King and Son, Ltd. 1933. pp. 304. 10s. 6d.

CANNAN, EDWIN. *Economic Scarcities*. London: P. S. King. 1933. pp. 136. 4s. 6d.

CATTANEO, PAOLO. *La Distribuzione della Ricchezza*. Torino: Fratelli Bocca Editori. 1933. pp. 313. 32 lire.

Centimes additionnels autonomes portant sur les impôts directs en 1926 et 1928. Prague: Imprimerie M. Blantrich. 1931. pp. 270. 40 Kc. [La Statistique Tchécoslovaque, Vol. 48.]

CLARK, FRED E. *Readings in Marketing*. New York: Macmillan Company. 1933. pp. 798. [Revised Edition.]

Commerce Extérieur de la République Tchécoslovaque en 1931. Prague: Imprimerie Jar. Strojil, Prerov. 1932. pp. 258. 40 Kc. [La Statistique Tchécoslovaque, Vol. 83.]

CORNELL UNIVERSITY: AGRICULTURAL EXPERIMENT STATION. *The Physical Volume of Production in the United States*. Ithaca: The University. 1932. pp. 72. [Memoir, No. 144, by G. F. Warren, and F. A. Pearson.]

—. *Wholesale Prices for 213 Years, 1720-1932*. Ithaca: The University. 1932. pp. 222. [Memoir, No. 142, by Herman F. Stoker.]

DAVIS, JEROME. *The New Russia*. New York: The John Day Company. 1933. pp. 265. \$2.50.

DAY, CLIVE. *Economic Development in Modern Europe*. New York: The Macmillan Company. 1933. pp. 447. \$2.50.

DELEENER, GEORGES. *Théorie et Politique du Commerce International*. Brussels: Maurice Lamertine. 1933. pp. 445. 75 fr.

EPSTEIN, ABRAHAM. *Insecurity, a Challenge to America*. New York: Harrison Smith and Robert Haas, Inc. 1933. pp. 680. \$4.00.

FELS, SAMUEL S. *This Changing World*. Boston: Houghton Mifflin Company. 1933. pp. 295. \$2.50.

FORD, GUY STANTON. *Science and Civilization*. Minneapolis: The University of Minnesota Press. 1933. pp. 29. [The Day and Hour Series, No. 1.]

FRANCE: MINISTÈRE DES AFFAIRES ÉTRANGERES, DOCUMENTS DIPLOMATIQUES FRANÇAIS, 1871-1914. Paris: Imprimerie Nationale. 1932. pp. 555. [Second Series, 1901-1911, Tome IV.]

FRASER, H. F. *Great Britain and the Gold Standard*. London: Macmillan and Company, Ltd. 1933. pp. 206. 8s. 6d.

GEIGER, GEORGE R. *The Philosophy of Henry George*. New York: The Macmillan Company. 1933. pp. 581. \$3.00.

GHOSE, PRAFULLA CHANDRA. *The Theory of Profits*. Calcutta: Calcutta University Press. 1933. pp. 442.

GOLDSCHMIDT, R. W. *Bankkredit und Kreditbanken*. Berlin: Junker und Dünnhaupt Verlag. 1933. pp. 144. RM. 8. [Veröffentlichung des Instituts für Finanzwesen an der Handels-Hochschule Berlin, Band 4.]

GREAT BRITAIN, MINISTRY OF LABOUR. *Report for the year 1932*. London: H. M. Stationery Office. 1933. pp. 123. 2s. [Cmd. 4281.]

GREER, HOWARD C. *Customer Turnover Experience of Meat Packing Companies*. Chicago: School of Business, University of Chicago. 1933. pp. 34. 50 cents. [Studies in Business Administration, Volume III, No. 3.]

GREGORY, T. E. *Das Silber-Problem*. Berlin: Julius Springer. 1932. pp. 60. [Währungspolitische Zeitfragen, Heft 1.]

HALL, FRED S., Editor. *Social Work Year Book*, 1933. New York: Russell Sage Foundation. 1933. pp. 680. \$4.00 [Second Issue.]

HAMLIN, INA M., and WINAKOR, ARTHUR H. *Department Store Food Service*. Urbana, Illinois: University of Illinois. 1933. pp. 37. [Bulletin, Bureau of Business Research, Vol. XXX, No. 31.]

HANSEN, ALVIN H., and MURRAY, MERRILL G. *A New Plan for Unemployment Reserves*. Minneapolis: University of Minnesota Press. 1933. pp. 75. \$1.00. [Employment Stabilization Research Institute.]

HARRIS, S. E. *Twenty Years of Federal Reserve Policy*. Cambridge: Harvard University Press. 1933. pp. 865. \$7.50. [Harvard Economic Studies No. 41.]

HEYMAN, LOUIS. *The New Aspect of the Oil Problem*. London: "Petroleum Times." 1933. pp. 112. 3s. 6d.

HINDMARSH, ALBERT E. *Force in Peace*. Cambridge: Harvard University Press. 1933. pp. 249. \$2.50.

HOAGLAND, HENRY E. *Corporation Finance*. New York: McGraw-Hill Book Company. 1933. pp. 463. \$3.50.

INNIS, HAROLD A. *Problems of Staple Production in Canada*. Toronto: The Ryerson Press. 1933. pp. 124. \$2.50.

JACKSON, J. HAMPDEN. *Europe since the War*. New York: E. P. Dutton and Company, Inc. 1933. pp. 142.

JEWKES, JOHN, and WINTERBOTTOM, ALLAN. *An Industrial Survey of Cumberland and Furness*. Manchester: Manchester University Press. 1933. pp. 175. 6s.

KEYNES, JOHN MAYNARD. *Essays in Biography*. New York: Harcourt, Brace and Company. 1933. pp. 318. \$2.50.

—. *The Means to Prosperity*. New York: Harcourt, Brace and Company, Inc. 1933. pp. 37. 30 cents.

—. *The Means to Prosperity*. London: Macmillan and Company, Ltd. 1933. pp. 37. 1s. [Enlarged version of four articles printed in *The Times* in March 1933.]

KIDD, HOWARD C. *Regulation of Intercoastal Commerce*. Pittsburgh: University of Pittsburgh. 1932. pp. 87. [Bulletin, Vol. 28, No. 21.]

KILLOUGH, HUGH B., and BARRINGTON ASSOCIATES, INC. *The Economics of Marketing*. New York: Harper and Brothers. 1933. pp. 608. \$3.50.

KIRKPATRICK, CLIFFORD. *Report of a Research into the Attitudes and Habits of Radio Listeners*. St. Paul: Webb Book Publishing Company. 1933. pp. 63.

KUZNETS, SIMON. *Seasonal Variations in Industry and Trade*. New York: National Bureau of Economic Research. 1933. pp. 455. [Publications, Number 22.]

LANGE, OSKAR. *Die Preisdispersion als Mittell zur statistischen Messung wirtschaftlicher Gleichgewichtsstörungen*. Leipzig: Hans Buske Verlag. 1932. pp. 56. RM. 4. [Veröffentlichungen der Frankfurter Gesellschaft für Konjunkturforschung, Neue Folge, Heft 4.]

LEHMAN, LOUIS H. *Traveling to Prosperity*. Philadelphia. Louis H. Lehman. 1933. pp. 62. [First Edition for Free Distribution.]

MARSHALL, LEON C. *Unlocking the Treasures of the Trial Courts*. Baltimore: Johns Hopkins Press. 1933. pp. 42. 75 cents.

METROPOLITAN LIFE INSURANCE COMPANY. *British Experience with Unemployment Insurance*. New York: The Company. 1933. pp. 47. [A Summary of Evidence Taken by the Royal Commission on Unemployment Insurance. Parts 4 and 5.]

METROPOLITAN LIFE INSURANCE COMPANY. *British Experience with Unemployment Insurance*. New York: The Company. 1933. pp. 54. [A Summary of Evidence Taken by the Royal Commission on Unemployment Insurance, Part 6.]

MICHALSKI, KURT. *Das Prinzip der Preisdifferenzierung*. Leipzig: Universitätsverlag von Robert Noske. 1932. pp. 87. RM 3.50. [Marburger sozialökonomische Forschungen, Heft I.]

MISES, LUDWIG and SPIETHOFF, ARTHUR. *Probleme der Wertlehre*. München: Duncker und Humblot. 1933. pp. 132. RM 4.80. [Mündliche Aussprache über die Wertlehre im theoretischen Ausschuss des Vereins für Sozialpolitik, Zweiter Teil.]

MLYNARSKI, FELIKS. *Credit and Peace*. London: George Allen and Unwin, Ltd. 1933. pp. 92. \$1.25.

MOULTON, H. G. *International Economic Recovery*. Minneapolis: The University of Minnesota Press. 1933. pp. 25. [The Day and Hour Series, No. 4.]

NASH, L. R. *Public Utility Rate Structures*. New York: McGraw-Hill Book Company. 1933. pp. 379. \$4.00.

NATIONAL INDUSTRIAL CONFERENCE BOARD. *The Situation in Germany at the Beginning of 1933*. New York: The Board. 1933. pp. 50. \$1.50.

OHLIN, BERTIL. *Interregional and International Trade*. Cambridge: Harvard University Press. 1933. pp. 617. \$5.00. [Harvard Economic Studies, No. 39.]

OLSEN, PAUL C. *A Study of the Sales of Individual Items in Four Types of Retail Drug Stores*. Philadelphia: University of Pennsylvania. 1929. pp. 39. [A thesis presented for the degree of Doctor of Philosophy.]

PRINCETON UNIVERSITY: INDUSTRIAL RELATIONS SECTION. *Employee Stock Ownership and the Depression*. Princeton: The University (Edwards Brothers, Printers). 1933. pp. 41.

REVUE DE L'INSTITUT INTERNATIONAL DE STATISTIQUE. La Haye: W. P. Van Stockum & Fils. 1933. pp. 116. [I Année, Livraison I.]

ROUCEK, JOSEPH S. *Contemporary Roumania*. Stanford University: Stanford University Press. 1932. pp. 422. \$4.00.

SCHMIDT, RICHARD, and GRABOWSKY, ADOLPH. *The Problem of Disarmament*. Berlin: Carl Heymans Verlag. 1933. pp. 235.

SHANN, E. O. G., and COPLAND, D. B. *The Australian Price-Structure*. Sydney: Angus and Robertson, Limited. 1933. pp. 271.

SNAVELY, T. R.; HYDE, D. C. and BISCOE, A. B. *State Grants-in-Aid in Virginia*. New York: The Century Company. 1933. pp. 244. \$2.50. [A Publication of the University of Virginia Institute for Research in the Social Sciences.]

SODDY, FREDERICK. *Wealth, Virtual Wealth and Debt*. New York: E. P. Dutton and Company, Inc. 1933. pp. 320.

SOMARY, FELIX. *End the Crisis!* New York: E. P. Dutton and Company, Inc. 1933. pp. 111. \$1.00.

SPARLING, EARL. *The Primer of Inflation*. New York: The John Day Company, Inc. 1933. pp. 133. \$1.50.

SPENCE, WILLIAM. *Tracts on Political Economy*. New York: (Privately printed — Viking Press). 1933. pp. 265. [Reprinted from an edition published in London, 1922.]

SYKES, JOSEPH. *British Public Expenditure, 1921-1931*. London: P. S. King and Son. 1933. pp. 388. 15s.

TAGLIACOZZO, GIORGIO. *Economia e Massimo Edonistico Colletivo*. Padova: Antonio Milani. 1933. pp. 136. 16 lire.

TURKEY: OFFICE CENTRAL STATISTIQUE. *Annuaire Statistique, 1931-1932*. Constantinople: The Office. 1932. pp. 474. [Publication, 21.]

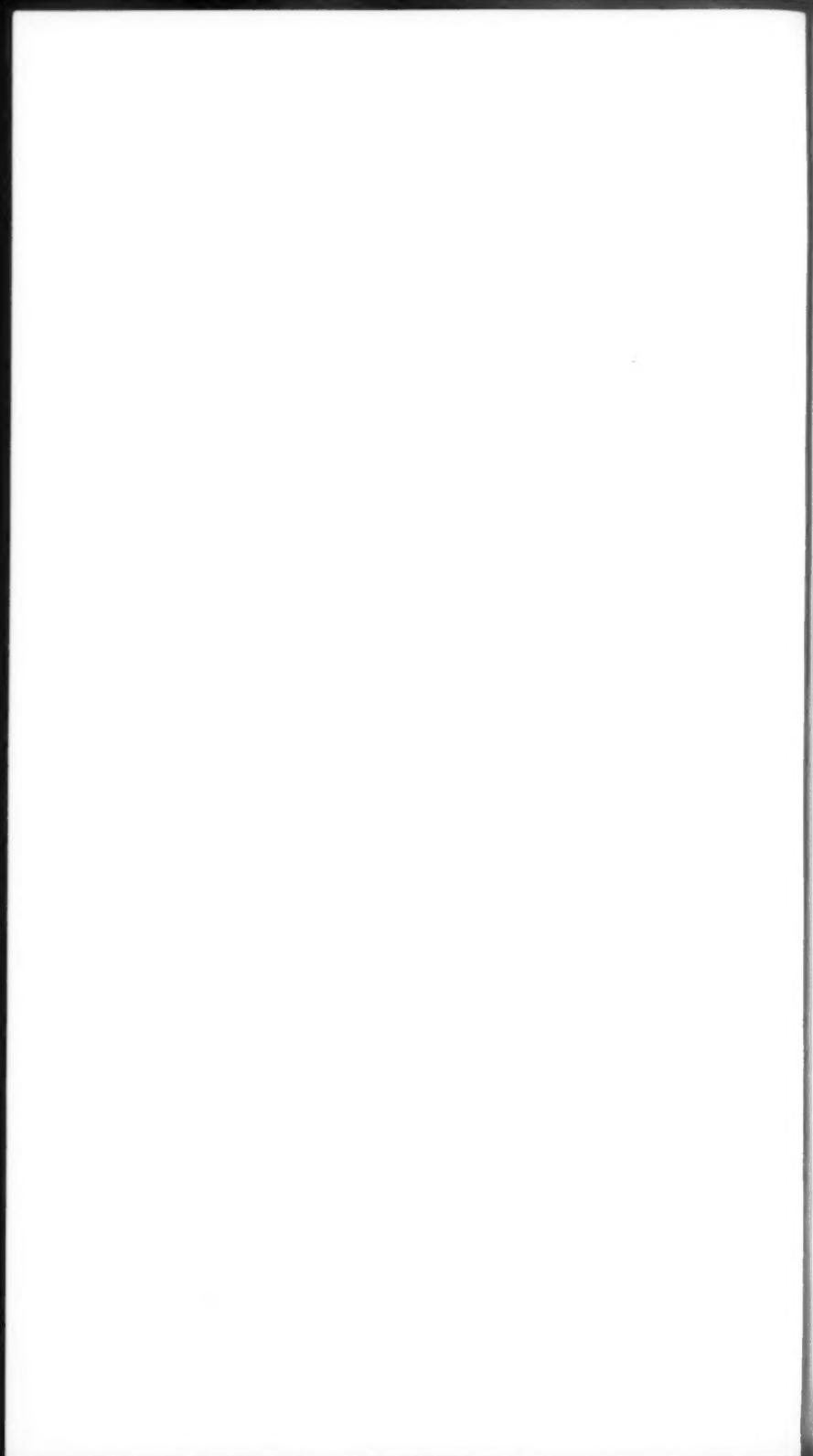
VEENSTRA, THEODORE A. *Housing Status of Salaried Workers Employed in Pittsburgh*. Pittsburgh: University of Pittsburgh. 1932. pp. 99. [Bulletin, Vol. 28, No. 20.]

VINER, JACOB. *Balanced Deflation, Inflation, or More Depression.* Minneapolis: The University of Minnesota Press. 1933. pp. 30. [The Day and Hour Series, No. 3.]

VON BECKERATH, HERBERT. *Modern Industrial Organization.* New York: McGraw-Hill Book Company. 1933. pp. 385. \$4.00.

WHITE, HARRY D. *The French International Accounts, 1880-1913.* Cambridge: Harvard University Press. 1933. pp. 359. \$4.00. [Harvard Economic Studies 40.]

YOUNG, JAMES T. *The New American Government and Its Work.* New York: The Macmillan Company. 1933. pp. 1024. \$3.50. [Third Edition.]



HARVARD ECONOMIC STUDIES

Volume	Price
I. <i>The English Patents of Monopoly</i> , by William Hyde Price, Ph.D.	\$2.00
II. <i>The Lodging-House Problem in Boston</i> , by Albert Benedict Wolfe, Ph.D.	\$2.00
III. <i>The Stannaries: a Study of the English Tin Miner</i> , by George R. Lewis, Ph.D.	\$2.00
IV. <i>Railroad Reorganization</i> , by Stuart Daggett, Ph.D.	\$2.50
V. <i>Wool-Growing and the Tariff</i> , by C. W. Wright, Ph.D.	Out of print
VI. <i>Public Ownership of Telephones on the Continent of Europe</i> , by Arthur Norman Holcombe, Ph.D.	\$2.50
VII. <i>The History of the British Post Office</i> , by Joseph C. Hemmeon, Ph.D.	\$2.50
VIII. <i>The Cotton Manufacturing Industry in the United States</i> , by Melvin Thomas Copeland, Ph.D.	\$2.50
IX. <i>The History of the Grain Trade in France, 1400-1710</i> , by Abbott Payson Usher, Ph.D.	\$2.50
X. <i>Corporate Promotions and Reorganizations</i> , by Arthur S. Dewing, Ph.D.	\$3.00
XI. <i>The Anthracite Coal Combination in the United States</i> , by Eliot Jones, Ph.D.	\$2.00
XII. <i>Some Aspects of the Tariff Question</i> , by Frank William Taussig, Ph.D., Litt.D., LL.D.	\$4.00
XIII. <i>The Evolution of the English Corn Market from the Twelfth to the Eighteenth Century</i> , by Norman S. B. Gras, Ph.D.	\$3.00
XIV. <i>Social Adaptation</i> , by Lucius Moody Bristol, Ph.D.	\$2.50
XV. <i>The Financial History of Boston</i> , by Charles Phillips Huse, Ph.D.	\$2.50
XVI. <i>Essays in the Earlier History of American Corporations</i> , by Joseph Stancliffe Davis, Ph.D. 2 vols.	Each, \$3.00
XVII. <i>The State Tax Commission</i> , by Harley Leist Lutz, Ph.D.	\$3.25
XVIII. <i>The Early English Customs System</i> , by Norman S. B. Gras, Ph.D.	\$3.50
XIX. <i>Trade and Navigation between Spain and the Indies in the Time of the Habsburgs</i> , by Clarence Henry Haring, Ph.D.	\$2.75
XX. <i>The Italian Emigration of Our Times</i> , by Robert F. Foerster, Ph.D.	\$3.00
XXI. <i>The Mesta: A Study in Spanish Economic History, 1273-1834</i> , by Julius Klein, Ph.D.	\$4.00
XXII. <i>Argentine International Trade under Inconvertible Paper Money, 1880-1900</i> , by John H. Williams, Ph.D.	\$3.50
XXIII. <i>The Organization of the Boot and Shoe Industry in Massachusetts before 1875</i> , by Blanche Evans Hazard, A.M.	\$3.50
XXIV. <i>Economic Motives</i> , by Z. C. Dickinson, Ph.D.	\$2.50
XXV. <i>Monetary Theory before Adam Smith</i> , by Arthur E. Monroe, Ph.D.	\$3.00
XXVI. <i>Canada's Balance of International Indebtedness</i> , by Jacob Viner, Ph.D.	\$3.50
XXVII. <i>The History of the U.S. Post Office to the Year 1829</i> , by Wesley E. Rich, Ph.D.	\$2.00
XXVIII. <i>The Theory of International Prices</i> , by James W. Angell, Ph.D.	\$5.00
XXIX. <i>Forests and Sea Power: The Timber Problem of the Royal Navy</i> , by Robert G. Albion, Ph.D.	\$5.00
XXX. <i>Banking Theories in the United States before 1860</i> , by Harry E. Miller, Ph.D.	\$2.50
XXXI. <i>Karl Marx's Interpretation of History</i> , by Mandell M. Bober, Ph.D.	\$3.50
XXXII. <i>Grain Growers' Co-operation in Western Canada</i> , by Harold S. Patton, Ph.D.	\$5.00
XXXIII. <i>The Assignats</i> , by Seymour E. Harris	\$3.50
XXXIV. <i>The Economic and Social History of an English Village (Crawley, Hampshire) 900-1928</i> , by N. S. B. Gras and Ethel C. Gras	\$7.50
XXXV. <i>Direct Taxation in Austria</i> , by John W. Van Sickle	\$3.00
XXXVI. <i>Greenbacks and the Resumption of Specie Payment</i> , by Don C. Barrett	\$3.00
XXXVII. <i>The Street Railway in Massachusetts</i> , by Edward S. Mason	\$3.00
XXXVIII. <i>The Theory of Monopolistic Competition</i> , by Edward H. Chamberlin	\$2.50
XXXIX. <i>Interregional and International Trade</i> , by Bertil Ohlin	\$5.00
XL. <i>The French International Accounts, 1880-1913</i> , by Harry D. White	\$4.00
XLI. <i>Twenty Years of Federal Reserve Policy</i> , by S. E. Harris	\$7.50

HARVARD UNIVERSITY PRESS

30 Randall Hall, Cambridge, Mass.

SCIENTIFIC PUBLICATIONS OF HARVARD UNIVERSITY

Harvard Oriental Series. Under the direction of the Department of Indic Philology. Vols. I-XXXII have been published. Several more volumes in preparation.

Harvard Semitic Studies. Nine volumes have been published.

Harvard Studies in Classical Philology. Edited by the Instructors in Classics. Vols. I-XLIII have been issued.

Studies and Notes in Philology and Literature. Under the direction of the Modern Language Departments. Vols. I-XV have been published.

Harvard Studies in Romance Languages. Published under the direction of the Department of Romance Languages. Vols. I-IX have been issued.

Harvard Business Studies. Four volumes have been published.

Harvard Studies in Comparative Literature. Ten volumes have been published.

Harvard Bulletins in Education. Eighteen volumes have been published.

Harvard Monographs in Education. Twelve volumes have been published.

Harvard Studies in Education. Nineteen volumes have been published.

Harvard Historical Studies. Under the direction of the Department of History and Government. Vols. I-XXXIV have been published.

The Quarterly Journal of Economics. Under the direction of the Department of Economics. Vols. I-XLVI have been published. Subscription, \$5.00.

Harvard Business Review. Issued quarterly by the Graduate School of Business Administration. Published through the McGraw-Hill Book Co., New York.

The Review of Economic Statistics. Published quarterly under the direction of the Harvard University Committee on Economic Research. Vols. I-XV have been published.

Harvard Economic Studies. Under the direction of the Department of Economics. Vols. I-XLI have been published.

Publications of the Bureau of Business Research. Ninety-one bulletins have been issued.

Publications of the Bureau for Research in Municipal Government. Two volumes have been issued.

Harvard Studies in Administrative Law. Four volumes have been published.

Harvard Studies in Jurisprudence. Published under the direction of the Faculty of Law. Four volumes have been published.

Harvard Studies in Administrative Law. Six volumes have been published.

Harvard Series of Legal Bibliographies. One volume has been published.

The Harvard Law Review. Edited by a board of students of the Harvard Law School. Published at Austin Hall. Vols. I-XLVI have been issued.

Harvard Psychological Studies. Edited by the Harvard Psychological Laboratory. Vols. I-IV have been issued.

Publications of the Astronomical Observatory. More than a hundred large quarto volumes of Annals have been published.

Publications of the Museum of Comparative Zoölogy. Bulletins, seventy-three volumes; Memoirs, fifty-three volumes, have been published.

Publications of the Peabody Museum of American Archaeology and Ethnology. Annual Reports, sixty-five numbers; Archaeological and Ethnological Papers, thirty-nine numbers; Memoirs, seventeen numbers, have been published.

The Harvard Theological Review. Edited by a Committee of the Faculty of the Harvard Divinity School. Vols. I-XXVI have been published. Subscription, \$3.00.

Harvard Theological Studies. Published under the direction of the Faculty of Divinity. Sixteen volumes have been issued.

Bulletin of the Bussey Institution. Vols. I and II have been issued. Address the Bussey Institution, Jamaica Plain, Mass.

Journal of Economic and Business History. Issued quarterly by the Graduate School of Business Administration. Published through the Harvard University Press. Subscription, \$5.00. *Temporarily suspended.*

UNLESS A SPECIAL PUBLISHER IS NAMED ORDERS SHOULD BE SENT TO THE
HARVARD UNIVERSITY PRESS
30 RANDALL HALL, CAMBRIDGE, MASS.

F